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GEHT'S EUCH NOCH GUT?

Es ist sehr gut möglich, dass Sie diese Zeilen irgendwo im Kölner Kongresszentrum lesen, wo auch in diesem Jahr wieder die GDC Europe stattfindet, wie immer mit Making Games als offiziellem Medienpartner. Vielleicht lesen Sie diese Zeilen aber auch auf Ihrem Weg zum Recruiting-Forum gamescom Jobs & Karriere, das wir gemeinsam mit unseren Kollegen von der Computerwoche organisieren. Und irgendwo neben diesen Zeilen dürfte die neueste Ausgabe unseres Branchenverzeichnisses Key Players liegen, das Abonnenten wie immer kostenlos dazubekommen und das natürlich auch auf der GDC Europe und der gamescom ausliegt.

Eigentlich ist also alles wie immer. Trotzdem wissen wir schon jetzt, dass wir in Köln sehr häufig die oben genannte Frage gestellt bekommen werden. Denn Making Games ist ebenso wie unsere Schwesterpublikationen GamePro und GameStar vom französischen Medienkonzern webedia gekauft worden. Und da wir mit unserer verhältnismäßig kleinen Zielgruppe auch die kleinste Publikation sind, ist die Sorge um uns naturgemäß am größten. Diese Sorge ehrt uns; zeigt sie doch, dass wir unserer kleinen, aber feinen Zielgruppe wirklich etwas bedeuten.

Ein 84-seitiges Lebenszeichen

Um die Frage aller Fragen also schon im Messevorfeld zu beantworten: Ja, uns geht es gut. Making Games ist für webedia ein genauso wichtiger Baustein, wie wir es für IDG waren. Natürlich haben wir auch Herausforderungen zu meistern wie den eingebrochenen Anzeigenmarkt. Aber dann müssen wir eben nach kreativen Lösungen suchen wie der im letzten Jahr gestarteten Online-Jobbörse making-games.biz/jobs, deren Angebote Sie übrigens inzwischen auch auf der Website des G.A.M.E.-Verbandes finden.

Die aktuelle Ausgabe ist hoffentlich ebenfalls ein kräftiges Lebenszeichen. Besonders stolz sind wir natürlich auf unser 20-seitiges Making-of zu Wargamings World of Warships (S. 12). Egal ob mit IDG oder webedia im Rücken: Unser Ziel war, ist und bleibt es, die bestmögliche Informations- und Weiterbildungsquelle für Game Developer zu liefern.

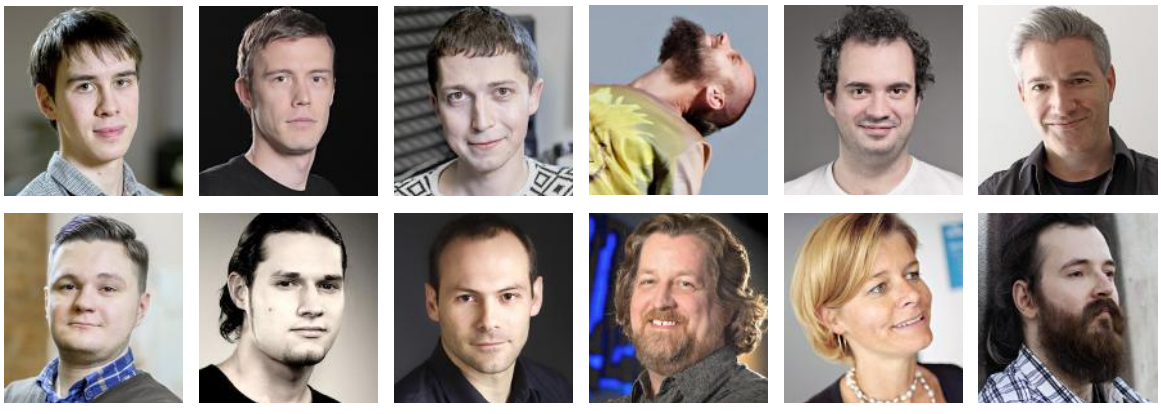
Und schon im Oktober wollen wir ein neues Projekt starten, das uns diesem Ziel wieder ein Stückchen näherbringt: das Making Games Devblog. Hier können künftig Entwickler aus aller Welt unkompliziert ihre Developer Diaries veröffentlichen und sie so einem ebenso breiten wie interessierten Publikum zugänglich machen. Lust mitzumachen? Dann schreiben sie uns eine Mail an **editor@makinggames.biz**.

Viel Spaß mit der aktuellen Ausgabe!

das Team von Making Games

Heiko Klinge
ist Chefredakteur vom Making Games Magazin

»Making Games ist für webedia ein genauso wichtiger Baustein, wie wir es für IDG waren.«



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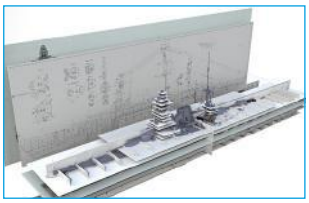

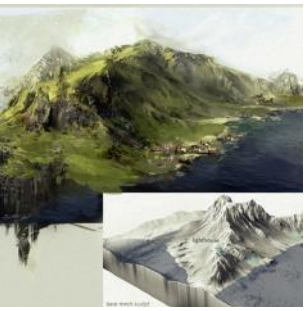

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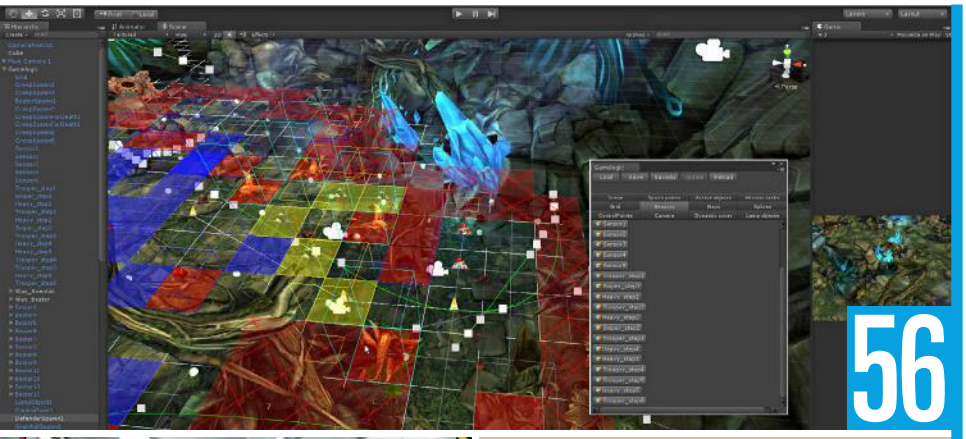

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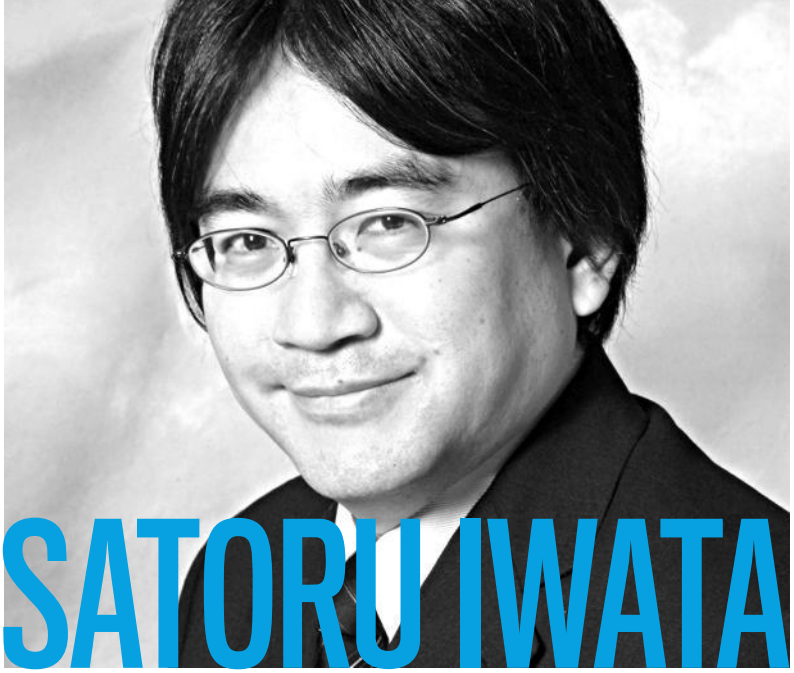


NACHRUF SATORU IWATA

EIN MANN, DER DIE WELT BEWEGTE

Er war Programmierer, Entwickler, Gamer und Chef des traditionsreichsten Unternehmens der Videospielgeschichte. Satoru Iwata war der frische Wind, den Nintendo im letzten Jahrzehnt so dringend brauchte. Nun ist seine Ära viel zu früh zu Ende gegangen.

Es ist ein denkbar schweres Erbe, das Satoru Iwata Mitte 2002 antritt: Mit gerade mal 42 Jahren soll er die Führung von Nintendo übernehmen, als erst vierter Chef in der 113-jährigen Unternehmensgeschichte. Und als erster Firmenlenker, der nicht aus dem Clan des Gründers Fusajiro Yamauchi stammt. Chef Nr. 3, der seit 1949 regierende und ebenso smarte wie starrköpfige Hiroshi Yamauchi, räumt 2002 seinen Posten – zu einer Zeit, in der Nintendo einer unsicheren Zukunft entgegensieht. Mit dem Gamecube ist man dabei, ein zweites Mal in Folge von Sony auf die Bretter geschickt zu werden. Zudem hat das Microsoft vor kurzem ebenfalls den Konsolenring betreten – mit prall gefüllter Börse und dem festen Vorsatz, die Hoheit über das Wohnzimmer des 21. Jahrhunderts zu erkämpfen. Wer dies (zunächst) schafft, ist jedoch Nintendo unter Iwatas Führung: Bevor die siebte Konsolengeneration mit der Veröffentlichung der Xbox 360 eingeläutet wird, verabschiedet man sich offiziell aus der virtuellen Materialschlacht. Iwata präsentiert auf der Keynote der Tokyo Game Show 2005 die »Nintendo Revolution« – eine Heimkonsole, bei der die technischen Spezifikationen zunächst außen vor bleiben, und bei der man sich einzig auf den neuartigen Controller konzentriert.

Gespür für neue Spieler

Die Wiimote, wie die Spielefernbedingung später heißen wird, soll durch ihre Einfachheit die Berührungsängste von Nichtspielern abbauen und neue Zielgruppen für Nintendo erschließen. Wie beim Nintendo DS, der ebenfalls unter Iwatas Ägide entsteht und Mitte 2004 präsentiert wird, stößt das Konzept der Wii zunächst auf lautstarke, bissige Skepsis. Wie beim DS lässt der Erfolg die Unkenrufe aber rasch verstummen. Letztlich verkauft sich die Wii sagenhafte 101,52 Millionen Mal. Dass Nintendo solche Wagnisse eingeht, ist in weiten Teilen Iwatas Verdienst. Und dass Iwata an die Visionen von Doppelbildschirm und Bewegungsteuerung glaubt, hat viel mit dessen gut zwanzigjährigem Weg auf Nintendos Chefposten zu tun. »Wenn ich einer dieser Präsidenten wäre, die keine Erfahrung als Entwickler oder Ingenieur haben, hätte ich vielleicht eine eher lineare Weiterentwicklung des Controllers befürwortet,« sagt Iwata in einem Interview zur Revolution-Enthüllung.

> **»Auf meiner Visitenkarte bin ich ein Firmenpräsident. In meinem Kopf bin ich ein Spieleentwickler. Aber in meinem Herzen bin ich ein Gamer«**

Schon früh interessiert sich Satoru Iwata für Computer und Videospiele; ab seiner Studienzeit am Tokyo Insititute of Technology arbeitet er für das Entwicklerstudio HAL Laboratory, das von einer Gruppe junger Leute 1980 im Tokioter Elektronikmekka Akihabara gegründet wird. Er programmiert Spiele für VC20 (den Galaxian-Clone Star Battle), NES (3D Hot Rally, Hole in One Professional) und SNES (Earthbound), außerdem tritt er für zahllose Nintendo-Klassiker – von Ice Climber über Super Mario Bros. 3 bis zu etlichen Kirby- und Pokémon-Titeln – als Produzent auf. Bereits als Chef von HAL Laboratory in den frühen 1990ern kümmert sich Iwata nicht nur um die Entwicklung von Spielen, sondern auch um ihre Finanzierung und Vermarktung. Als er 2000 endgültig zu Nintendo stößt, kennt er alle Seiten des Business, vereint in seiner Person Technikkompetenz, Kreativität und Geschäftssinn.

Freundlich und feinsinnig

Gleichzeitig gewinnt Iwata in der Industrie und vor allem bei Spielern durch seine gleichermaßen bescheidene wie offene Art viel Sympathie: Iwata demonstriert in YouTube-Videos seinen Respekt vor den Fans, indem er sich intensiv mit ihnen und den kommenden Nintendo-Produkten beschäftigt. Er bittet um Entschuldigung, wenn die Enttäuschung ob einer mauen E3-Pressekonferenz hohe Wellen schlägt. Stets beweist er einen feinen, leisen Humor, der ein angenehmes Gegenstück darstellt zur Entrücktheit japanischer Führungsetagen, aber auch zum brachialen Auftreten von Nintendos nordamerikanischem Marketingbulldozer Reggie Fils-Aimé.

Mit Satoru Iwata an der Spitze ist Nintendo einige Zeit lang über alle Maßen erfolgreich. Der Konzern wird in den letzten paar Jahren aber auch mit gewaltigen Herausforderungen – namentlich der miserablen Lage der jüngsten Heimkonsole Wii U – konfrontiert, die bewältigt werden müssen. Ob der vierte Nintendo-Chef das Unternehmen wieder zurück in die alte Wii-Erfolgsspur gebracht hätte, kann niemand sagen. Was aber sicher ist: Satoru Iwata hat viel dazu beigetragen, dass die lange und wechselhafte Geschichte Nintendos noch ein bisschen länger und wechselhafter geworden ist. Dass Marken gepflegt, Visionen realisiert und einzigartige Videospiele geschaffen wurden. Und dass ein einst kauziger und verschlossener Videospielkonzern ein menschliches und freundliches Gesicht bekommen hat. Den irrwitzig schweren Balanceakt zwischen Tradition und Innovation, den alle Welt von Nintendo fordert und erwartet, muss nun allerdings ein anderer leisten.

Saturo Iwata ist am 11. Juli 2015 im Alter von 55 Jahren an Gallenkrebs verstorben.

Stephan Freundorfer

GAMESCOM SCHON VOR DEM START AUF ERFOLGSKURS

Schon weit im Vorfeld stehen die Zeichen gut für die gamescom 2015, die vom 05. bis 09. August auf dem Gelände der KoelnMesse in Köln stattfindet. Die Veranstalter meldeten Anfang Juli, dass die Videospielemesse in diesem Jahr auf insgesamt 193.000 Quadratmetern Fläche stattfinden wird, was rund 18 Prozent mehr als im Vorjahr sind und auf denen 700 Aussteller aus 40 Ländern ihre Produkte vorstellen. Vorangegangen war Mitte Mai bereits die Meldung, dass die Tagestickets für den Samstag bereits ausverkauft seien und nur ein kleines Restkontingent bei der Handelskette Saturn oder als Nachmittagstickets vor Ort erhältlich wäre. Knapp vier Wochen später waren die Eintrittskarten auch für den Freitag, Anfang Juli für den Donnerstag vergriffen. Somit könnte die gamescom 2015 in guter alter Tradition wie immer das Vorjahr zu übertreffen.

Drei Fragen an ...

Tim Endres
ist Projektmanager gamescom bei Koelnmesse GmbH.

Making Games In diesem Jahr waren die Tickets für einzelne Tage bereits sehr früh ausverkauft. Gibt es daher Pläne, die Kapazitäten für 2016 zu erhöhen?
Tim Endres Die Ticketverkäufe zeigen, dass sich die gamescom ungebrochener Beliebtheit erfreut. Was die Pläne und Kapazitäten betrifft, so spielen hier viele Faktoren mit ein: belegte Fläche, Verweildauer der Gäste auf dem Gelände etc. Fakt ist: Es werden nur so viele Tageskarten verkauft, wie Besucher auf dem Gelände zulässig sind. Mit Blick auf das Kapazitätsmanagement und die Besucherlogistik sind die Sicherheit der Gäste und deren Aufenthaltsqualität oberstes Gebot für die Veranstaltung. Das gilt für die diesjährige gamescom genauso wie für 2016.

Making Games Der Business-Bereich wurde für die gamescom 2015 vergrößert. Welche Erwartungen hatten Sie im Vorfeld an diesen Schritt und wie war die Resonanz letztlich?
Tim Endres Die business area belegt 2015 die Hallen 2, 3.2 und 4. Aufgrund der erneuten Steigerung der Fachbesucherzahlen um sechs Prozent und der Position der gamescom als führende europäische Businessplattform der Computer- und Videospielindustrie erhält die business area 2015 zusätzliche 4.000 Quadratmeter. Die Flächenerweiterung, die neben der business area auch der entertainment area betrifft, soll neben den Ausstellerpräsenzen insbesondere der Aufenthaltsqualität aller Besucher zugutekommen. Einer Flächenerweiterung geht immer eine verstärkte Nachfrage und zusätzlicher Bedarf nach Präsentationsflächen vorweg. So war es auch bei der gamescom 2015. Unsere Erwartungen wurden voll erfüllt.

Making Games Welche Neuerungen gibt es für die gamescom 2015 und welche Erwartungen haben Sie daran?
Tim Endres Die gamescom 2015 hat zahlreiche Neuerungen zu bieten. Für Merchandise-Artikel gibt es 2015 beispielsweise eine eigene Halle. Die »fan shop arena« belegt die Halle 5.1. Das »event level« mit zahlreichen Aktionen ist in der Halle 5.2 zu finden. Erstmals wird es einen speziell auf Familien mit Kindern im Alter zwischen 6 und 12 Jahren abgestimmten Bereich geben: »family & friends« feiert in der Halle 10.2 Premiere. Wir sind davon überzeugt, dass wir dank starker Ausstellerpräsenzen und einem umfangreichen Rahmenprogramm Fachbesuchern und Spielefans wieder eine inspirierende und unvergessliche gamescom bieten werden. Insgesamt belegt die gamescom 193.000 Quadratmeter.

Eventkalender

www.makinggames.biz
Online-Eventkalender mit Suchfunktion und Veranstaltungsinfos

AUGUST 2015

SIGGRAPH conference
Ort Los Angeles, Los Angeles Convention Center
Termin 09. bis 13. August 2015
Thema Konferenz
Kosten 46 bis 1454 Euro
Homepage s2015.siggraph.org

Casual Connect USA
Ort San Francisco, Hilton Union Square
Termin 11. bis 13. August 2015
Thema Messe
Kosten 456 bis 4101 Euro
Homepage usa.casualconnect.org

SEPTEMBER 2015

IFA
Ort Berlin, Berlin ExpoCenter City
Termin 04. bis 09. September 2015
Thema Messe
Kosten 37 bis 69 Euro
Homepage www.ifa-berlin.de

Tokyo Game Show
Ort Tokyo, Makuhari Messe
Termin 17. bis 20. September 2015
Thema Messe
Kosten Noch nicht bekannt
Homepage expo.nikkeibp.co.jp/tgs/2015/exhibition/english

OKTOBER 2015

Brasil Game Show
Ort São Paulo, Expo Center Norte
Termin 08. bis 12. Oktober 2015
Thema Messe
Kosten 11 bis 24 Euro
Homepage www.brasilgameshow.com.br

animago Award & Conference
Ort Postdam-Babelsberg, Filmpark Babelsberg
Termin 15. bis 16. Oktober 2015
Thema Konferenz
Kosten 48 bis 78 Euro
Homepage www.animago.com

Medientage München
Ort München, ICM/Messe München
Termin 21. bis 23. Oktober 2015
Thema Konferenz
Kosten Noch nicht bekannt
Homepage www.medientage.de

GDC China
Ort Shanghai, Shanghai International Convention Center
Termin 25. bis 27. Oktober 2015
Thema Konferenz
Kosten 74 bis 882 Euro
Homepage www.gdcchina.com

Game Connection Europe
Ort Paris, Paris Expo
Termin 28. bis 30. Oktober 2015
Thema Messe
Kosten 90 bis 4800 Euro
Homepage www.game-connection.com

NOVEMBER 2015

Games for Health Europe
Ort Utrecht, Jaarbeurs Utrecht
Termin 02. bis 03. November 2011
Thema Konferenz
Kosten 325 bis 525 Euro
Homepage www.gamesforhealtheurope.co.nl

Passiert auf makinggames.biz

Cloud Imperium Games eröffnet Zweigstelle in Frankfurt

Anfang Juli hat Cloud Imperium Games, das Entwicklerstudio hinter »Star Citizen«, die Gründung einer Zweigstelle in Frankfurt offiziell bekannt gegeben, nachdem sie wohl schon einige Zeit die Arbeiten am Weltraum-Titel aufgenommen hatte. 21 erfahrene Mitarbeiter soll das neue Büro bereits beheimaten, die zuvor unter anderem an der Erstellung der CryEngine mitgewirkt hätten – es handelt sich also vermutlich um ehemalige Crytek-Angestellte. Bis zum Ende dieses Jahres soll die Belegschaft auf insgesamt 50 Personen anwachsen. Der Außenposten in Frankfurt ist dem in Manchester ansässigen Foundry 42 unterstellt, außerdem sollen die deutschen Programmierer bereits an der Einzelspieler-Kampagne von »Star Citzizen« namens »Squadron 42« und dem kommenden First-Person-Shooter-Modul mitgewirkt haben.

Oculus finanziert Rift-exklusive Spiele

Oculus möchte seine VR-Brille Rift offensichtlich nicht nur als innovatives Stück Hardware etablieren, sondern als Spieleplattform. Oculus-CEO Brendan Iribe verkündete Anfang Juli gegenüber Gamasutra, dass die Firma das sogenannte Oculus-Studios-Programm ins Leben gerufen hätte. Über dieses sollen bisher insgesamt 24 Titel finanziert werden, die später exklusiv für das VR-Headset Rift erscheinen. Dabei sei es sowohl möglich, dass Studios auf Oculus zukommen, Konzepte pitchen und das benötigte Kapital erhalten, als auch, dass Oculus selbst auf Entwickler zugeht und Ideen unterbreitet. Zusätzlich zu diesem Programm ist Oculus auch im Bereich Publishing tätig, in dem die Firma finanziell nur unter die Arme greift, statt direkt das komplette Projekt zu bezahlen.

Dead Island 2: Deep Silver trennt sich von Entwickler Yager

Mitte Juli verkündete Publisher Deep Silver eine unerwartete Entscheidung: Das Münchner Tochterunternehmen von Koch Media hat sich von Yager Development getrennt, das Berliner Studio arbeitet somit nicht mehr am Mehrspieler-Zombie-Shooter »Dead Island 2«. Die Gründe für diesen Entschluss führte Deep Silver nicht aus, sprach lediglich von langen Überlegungen. Ebenso wenige wurde kommentiert, wer die Entwicklung weiterführen solle. Wenige Tage später meldete sich Timo Ullmann, CEO von Yager, ebenfalls zu Wort und führte aus, dass sein Team und Deep Silver »unterschiedliche Vorstellungen von diesem Projekt« gehabt hätten, was letztlich zur Trennung geführt habe. Gerüchte dagegen sprachen davon, dass Yager mit technischen Problemen bei der Umsetzung des ambitionierten Projekts zu kämpfen gehabt und dadurch Milestones nicht eingehalten hätte. Auf Seiten von Deep Silver könnten zudem Neubesetzungen von Schlüsselpositionen für Schwierigkeiten gesorgt haben. Yager möchte die nun freigewordenen Kapazitäten komplett auf die Entwicklung des Free2Play-Titels »Dreadnought« konzentrieren. Außerdem arbeite das Berliner Studio an weiteren Projekten, zu denen erste Informationen für die gamescom 2015 versprochen wurden.

Microsoft schreibt Gelder für Augmented-Reality-Forschung aus

Zuletzt hat Microsoft seine Augmented-Reality-Brille HoloLens auf der E3 in Los Angeles präsentiert und dort gezeigt, wie Minecraft im freien Raum gespielt werden könnte. Doch dem Konzern scheint es vor allem auch wichtig zu sein, die HoloLens nicht nur für Spieler interessant erscheinen zu lassen, sondern sie alltagstauglich zu machen. Microsoft hat daher Anfang Juli fünfmal 100.000 Dollar als Forschungsgelder für Universitäten und wissenschaftliche Einrichtungen ausgeschrieben. Forscher können sich für die finanzielle Unterstützung bewerben und sollen dann vor allem herausfinden, wie sich Augmented Reality unter anderem in den Bereichen Kommunikation, Medizin und Psychologie oder in Schulen einsetzen lässt.

Apple bannt kurzzeitig Spiele
aufgrund der Flagge der Konföderierten

Ende Juni hatte Apple alle Spiele aus seinem App Store entfernt, in denen die Flagge der Konföderierten Staaten auftaucht. Grund für diesen Schritt war ein Amoklauf, der sich wenige Tage zuvor in Charleston, South Carolina in den USA ereignet hatte. Dieser rassistisch motivierte Anschlag auf eine Kirche wurde unter eben dieser Flagge verübt. Daraufhin entschieden sich Konzerne wie Amazon, eBay oder Walmart, jeglichen Verkauf von Artikeln zu stoppen, die mit der Flagge in Verbindung stehen. Eines der betroffenen Entwicklerstudios, Game-Labs, kommentierte Apples Schritt so, dass sie die Entscheidung akzeptieren aber gleichzeitig ihr Spiel »Ultimate General: Gettysburg« nicht verändern würden. Ihr Ziel sei es gewesen, ein möglichst akkurates Spiel zur Schlacht um Gettysburg zu erschaffen und sie seien sogar häufig von Lehrern gelobt worden, wie gut sich der Titel sogar im Unterricht einsetzen ließe. Apple kommentierte sein Vorgehen zunächst nicht. Einige Tage später ruderte der Konzern jedoch zurück und machte alle historisch relevanten Inhalte wieder verfügbar.

Jade Raymond **gründet Motive Studios**

Jade Raymond, die bis 2014 Managing Director bei Ubisoft Toronto war und dort unter anderem an der Assassin's-Creed-Reihe mitgewirkt hat, hat nun ein eigenes Entwicklerstudio gegründet. Motive Studios gehört zum Publisher EA und befindet sich im kanadischen Montreal. Sie beschreibt das Studio als »kreatives Team, das eine neue IP entwickeln und fantastische Projekte umsetzen wird.« Außerdem freue sie sich sehr auf eine Zusammenarbeit mit Amy Hennig und Visceral Games, dessen Leitung Raymond zusätzlich übernehmen wird. Visceral Games arbeitet gerade an einem neuen Star-Wars-Spiel, zu dem schon einige Hinweise aufgetaucht sind; unter anderem, dass das Spiel auf Material aus dem nie veröffentlichten Star Wars 1313 zurückgreifen werde, womöglich Han Solo der Protagonist sei und das Spiel Ähnlichkeiten zur Uncharted-Reihe aufweise. Auch mit dem Team von BioWare Montreal, das gerade an Mass Effect Andromeda arbeitet, will Raymond regen Kontakt halten.

Microsoft **entlässt mehrere tausend Mitarbeiter**

Seit Februar 2014 steht Satya Nadella an der Spitze von Microsoft und bereits vor rund einem Jahr kündigte der Manager an, dass Microsft sich auf lange Sicht von rund 18.000 Mitarbeitern trennen werde. Anfang Juli wandte sich Nadella mit einem offenen Brief an seine Mitarbeiter, in dem er aufzeigte, wo die Reise für Microsoft hingehen soll. Die Bereiche Mobile-Dienste, Cloud und auch Xbox seien hier besonders wichtige Geschäftsfelder für Microsoft. Spiele seien nach Nutzungszeit und Umsatz gerechnet die wichtigsten privaten Anwendungen. Weniger rosige Aussichten gibt es dagegen für die Mobile-Abteilungen. Nadella verkündete, dass der Plan, die Smartphone-Sparte weiter auszubauen, nicht weiter verfolgt würde, stattdessen wolle man den Fokus auf ein einheitliches Windows-Ökosystem legen. In Folge dessen sollen 7.800 Stellen gestrichen werden, wobei Nadella den betroffenen Mitarbeitern Unterstützung zusicherte.

Links

Wie man öffentliche Fördergelder bekommt.
www.makinggames.biz/public-funding

Die Zusammenfassung von 20 Jahren »X-COM«.
www.makinggames.biz/x-com

Ein Post Mortem zu »Command & Conquer: Tiberian Sun«.
www.makinggames.biz/command-and-conquer

Die Firmenhistorie von Electronic Arts.
www.makinggames.biz/how-EA-lost-its-soul

BRANCHEN-GEZWITSCHER
@MAKINGGAMES_DE/INTERESTING-PEOPLE

@NOTCH
Also, you can think for yourselves. You don't need a one hit wonder recognizable face to say that a lot of f2p practices are highly immoral.
Markus Persson, Minecraft-Erfinder

@LARALYN
Worked to troubleshoot a bug for about an hour last night before giving up and going to bed. This morning? 10 minutes.
Laralyn McWilliams, Creative Director bei The Workshop

@SAMLAKERMD
The inspiration for #AlanWake's poltergeist objects came from a scary looking physics bug early on in the project.
Sam Lake, Creative Director bei Remedy

@THEREALCLIFFYB
As much as I love Kickstarter and what it represents, it feels like it's turning into a new version of pre-ordering these days.
Cliff Bleszinski, CEO von Boss Key

@PATRICKWEEKES
I probably spend more time than most figuring out the best way to troll people who ask questions they should know I can't answer.
Patrick Weekes, Writer bei BioWare

@GEORGEB3DR
Always thought, and still think Ubi is more risky/creative with their internal games than EA, Activision, Take 2, etc.
George Broussard, Erfinder von Duke Nukem

@BIOMARKDARRAH
Fallout Shelter sure encourages some odd gender assignments; stud farms, and several unarmed women guarded by one or two armed men
Mark Darrah, Executive Producer von Dragon Age Inquisit ion

@BENJAMINCOUSINS
I'm not saying this bar is hipster but they are playing The White Stripes and there is an in-house barber.
Ben Cousins, ehemaliger Executive Producer bei Dice

@CHRISAVELLONE
Thanks to @mikeBithell for proving that story can make colored hopping blocks take on a life of their own. #ThankAGameDeveloper
Chris Avellone, Game Designer von Pillars of Eternity

JOIN THE CONVERSATION

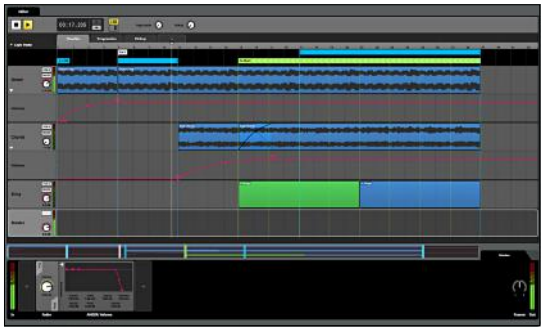
TOOLS

Keine guten Werkzeuge – keine guten Spiele! Experten aus der Branche sagen ihre Meinung zu aktuellen Programm-Updates sowie neuen Tools und verraten ihre persönlichen Software-Geheimtipps.

FMOD STUDIO WWW.FMOD.ORG

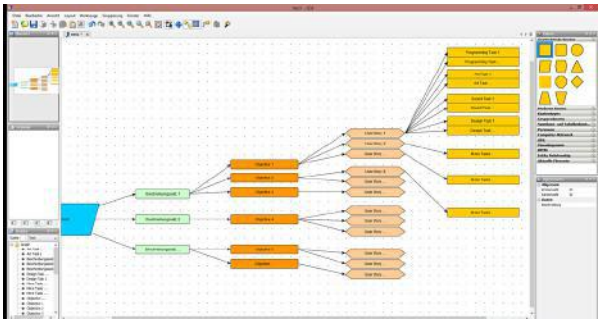
Stefan Randelshofer
ist Senior Audio Lead
bei Blue Byte.

Fmod Studio bietet alles, was das Audio-Director-Herz begehrt. Eine grafische Oberfläche erlaubt es Sound Designern, extrem komplexe Soundevents samt vom Code steuerbarer Parameter zu erstellen. Intelligente und interaktive Musiksysteme und die Verwaltung von Voice-Over gehört ebenfalls zu den Kernkompetenzen der Audio-Engine. Die solide API von Fmod Studio ermöglicht es dem Audio Coder, die vom Sound Designer erzeugten Events im Code aufzurufen und Parameter an sie zu übermitteln. Dadurch lassen sich extrem komplexe, interaktive Soundscapes erzeugen und komfortabel kontrollieren. Die Software ist für größere Projekte kostenpflichtig, bietet aber nach Budget gestaffelte Preisstufen und ist für Indie-Projekte und Non-Profit Games komplett kostenlos.



Zu den Kernkompetenzen von Fmod Studio gehören intelligente und interaktive Musiksysteme sowie die Verwaltung von Voice Over.

YED WWW.YWORKS.COM



yEd erlaubt es, komplexe Sachverhalte in leicht erklärenbare Diagramme zu verpacken.

Das Tool yEd eignet sich hervorragend, um den Kern von relevanten Informationen einfach und zugänglich darzustellen. Durch eine nahezu grenzenlose Flexibilität erlaubt dieses Tool, komplexe Sachverhalte in leicht erklärbare Diagramme zu verpacken. Es ist einfach zu bedienen und intuitiv. Innerhalb weniger Minuten lassen sich Diagramme, Arbeitsprozesse, Hierarchien oder Swimlane-Charts erstellen.

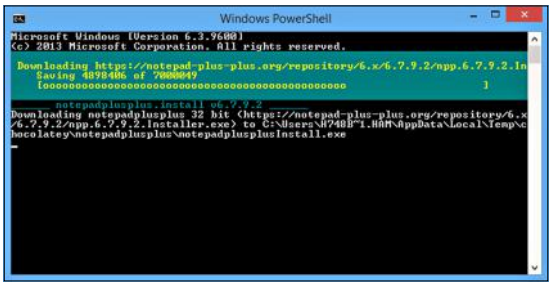
Als Game Designer kann man damit nicht nur schwer zu beschreibende Sachverhalte erklären, sondern beispielsweise auch die Freischaltungsreihenfolge seiner Spielinhalte darstellen, den Main-Game-Loop visualisieren oder den High-Level UI-Flow festlegen. Ein Muss für alle Feinde der »wall of text«.

Guido Schmidt
ist Lead Game Designer
bei OnlineFussballManager.

CHOCOLATEY WWW.CHOCOLATEY.ORG

Hans Hamm
ist Head of R&D
bei Deep Silver FISHLABS.

Mit Chocolatey ist es nun auch auf Windows Systemen möglich, ähnlich wie mit apt-get oder yum auf Linux Systemen, freie und kostenlose Software per Kommandozeile zu installieren. Dabei beachtet Chocolatey auch Abhängigkeiten zu anderen Paketen und installiert diese gleich mit. Man kann Chocolatey beispielsweise für Build-Skripte einsetzen, die sicherstellen, dass eine bestimmte Version von Ruby installiert ist. Auch für Administratoren eignet sich dieses Tool, um bestimmte Standard-Software unkompliziert über ein Batch-Skript zu installieren. Ob Python, Skype, VLC, Google Chrome, Mozilla Thunderbird oder Notepad++, in den über 2800 vorhandenen Paketen ist wirklich fast alles enthalten, was es an kostenloser Software gibt.



Endlich auch für Windows Systeme: Software per Kommandozeile installieren.

GDC EUROPE 2015

Wir haben uns drei Sprecher der GDC Europe vorab zum Interview geschnappt und gefragt, was sie sich von der diesjährigen Konferenz erhoffen und warum ihnen ihr Vortragsthema besonders am Herzen liegt.

Jim Brown
ist Senior Designer
bei Epic Games.

Making Games Was ist das Thema deines Vortrags?
Jim Brown Mein Vortrag trägt den Titel »Unreal Tournament: Lessons in Open Development«. Wir arbeiten im Moment an einem neuen AAA-Ableger der »Unreal Tournament«-Reihe und agieren hier komplett offen und Hand in Hand mit der Community. Jeder kann das Spiel zu jedem Zeitpunkt der Entwicklung herunterladen und ist dazu eingeladen Feedback beizutragen.

Making Games Warum ist dir dieses Thema persönlich so wichtig?
Jim Brown Ich habe seinerzeit als Modder in der Games-Branche angefangen und habe so immer eine starke Verbindung zur Community aufrechterhalten. Dadurch ist diese Art der Entwicklung eine tolle Möglichkeit, mich meinen Wurzeln zu besinnen und mal wieder etwas mit den Spielern zusammen zu erschaffen. Ich möchte dabei nach so vielen Jahren der Unterstützung »etwas zurückgeben«.

Making Games Was sollen die Zuhörer am Ende deines Vortrags mit nach Hause nehmen?
Jim Brown Ich will den Zuhörern vermitteln, wie sie ihr Kommunikationsverhalten verbessern können, wie man ein Team aufbaut und die Spieler-Community unterstützt. Außerdem möchte ich Tipps an die Hand geben, wie man Design-Herausforderungen lösen kann, die entstehen, wenn man mit Entwicklern arbeitet, die allesamt in verschiedenen Orten der Welt leben und unterschiedlich erfahren sind.

Making Games Was sind deine Erwartungen an die diesjährige GDC Europe?
Jim Brown Die GDC ist immer ein interessanter Ort, um zu beobachten, wie sich unsere Industrie wandelt und auf bestimmte Marktveränderungen reagiert. Ich habe das Gefühl, dass wir uns durchgehend weiterentwickeln und ich nehme immer neue Problemlösungsstrategien aus den vielen Vorträgen mit.

Making Games Was sind für dich persönlich die aktuell wichtigsten Entwicklungen in der Branche?
Jim Brown Data und UX sind in den vergangenen Jahren an die Spitze des Design-Prozesses gerückt und wir verstehen erst nach und nach, welche Effekte beides auf unsere Branche und die Spieler hat. Daher bin ich gespannt zu sehen, welche Auswirkungen dies auf lange Sicht hat und wie wir das einschätzen werden, wenn wir eines Tages zurückblicken.

Tomas Barak
ist Programmierer
bei Warhorse Studios.

Making Games Was ist das Thema deines Vortrags?
Tomas Barak Mein Vortrag trägt den Titel »Adaptive Clothing System in Kingdom Come: Deliverance«. Kurz zusammengefasst wird es dabei darum gehen, wie wir die Kleidungsstücke, Rüstungen und andere Ausrüstungsgegenstände der Charaktere prozedural erstellen und deformieren können.

Making Games Warum ist dir dieses Thema persönlich so wichtig?
Tomas Barak Einfach, weil es eine echte Herausforderung war. Ich habe bisher von niemandem gehört, der eine vergleichbare Vorgehensweise versucht hat und ich glaube daher, dass wir etwas komplett Neuartiges entwickelt haben.

Making Games Was sollen die Zuhörer am Ende deines Vortrags mit nach Hause nehmen?
Tomas Barak Ich hoffe, dass unsere Software-Lösung als Inspiration für andere Entwickler dienen kann, um vergleichbare Systeme in ihre Spiele zu integrieren. Unser System hilft den Artists im Team extrem, mit weniger Aufwand als zuvor viel realistischere Charaktere zu erstellen.

Making Games Was sind deine Erwartungen an die diesjährige GDC Europe?
Tomas Barak Ich bin das erste Mal auf der GDC Europe, daher habe ich keine Erwartungen, sondern lasse mich überraschen.

Making Games Was sind für dich persönlich die aktuell wichtigsten Entwicklungen in der Branche?
Tomas Barak Ich bin persönlich ein riesiger Fan von realistischer Grafik und daher freue ich mich besonders über die aktuellen Entwicklungen in den Bereichen Physically Based Rendering und Global Illumination.

Matthew Steinke
ist Lead Technical Designer
bei CD Projekt Red.

Making Games Was ist das Thema deines Vortrags?
Matthew Steinke Mein Vortrag »Witchcraft: The Alchemy of a Crafting-based Economy« ist ein kurzer Rückblick darauf, wie wir in »The Witcher 3« einen funktionierenden Wirtschaftskreislauf umgesetzt haben.

Making Games Warum ist dir dieses Thema persönlich so wichtig?
Matthew Steinke Sich das Wirtschaftsgefüge für »The Witcher 3« auszudenken und dann im Spiel umzusetzen, war die tollste Lernerfahrung in meiner Zeit bei CD Projekt Red. Obwohl es sich ein wenig öde anhören mag, ein Crafting-System zu entwickeln und dafür zu sorgen, dass das Wirtschaftssystem im Spiel ausgeglichen funktioniert, war ein riesiger Spaß. Und gleichzeitig bringt es für die Spieler, die nach Beschäftigungen abseits der Haupthandlung suchen, ein wenig frischen Wind.

Making Games Was sollen die Zuhörer am Ende deines Vortrags mit nach Hause nehmen?
Matthew Steinke Ich werde die Herausforderungen beschreiben, denen wir uns stellen mussten und hoffe, dass die Zuhörer dabei mitnehmen können, wie man den Design-Prozess vereinfachen, Exploits verhindern und das Balancing hinbekommen kann. Diese Erkenntnisse sind dann hoffentlich für ihr eigenes Projekt hilfreich.

Making Games Was sind deine Erwartungen an die diesjährige GDC Europe?
Matthew Steinke Ich erwarte, dass die GDC Europe ein wenig Licht in einige der aktuellen Trends bringen wird - etwa wie ein Spiel per Crowdfunding entwickelt werden kann oder was die an Bedeutung gewinnenden VR-Technologien für unsere Branche bedeuten.

Making Games Was sind für dich persönlich die aktuell wichtigsten Entwicklungen in der Branche?
Matthew Steinke Wenn ich eine Liste erstellen müsste, welche die einflussreichsten Entwicklungen in der Spielebranche aufzeigt, dann wären das Punkte wie: welche Effekte hat Virtual Reality und wie können wir immersivere Spiele entwickeln; der Trend, dass Publisher sich immer mehr auf digitale Distribution als bevorzugten Vertriebsweg ausrichten; dass eSports und Spieleturniere immer mehr an Wert gewinnen und die enorme Bedeutung von Indie-Entwickler. AAA-Publisher sind schon lange nicht mehr der einzige Spieler auf dem Feld!

THE DEVELOPMENT OF WORLD OF WARSHIPS

Wargaming explains why World of Warships was the next logical step in the company's portfolio and how the team approached the development as well as level design of naval battlefields.

Ivan Moroz
is Director of Global Operations at Wargaming.

Ivan Moroz oversees all global publishing activities for »World of Warships«. He defines and communicates product vision, researches market needs and trends to drive the product's strategy and development to achieve the business's goals.
Ivan joined Wargaming over two years ago, attracted by the dedicated »World of Warships« developers that he knew. He has worked on the RTS titles »Pacific Storm« and the »9th Company« by Lesta.

»World of Warships« is all about naval combat which turned out to have completely different design demands than Wargamings previous games about tanks and warplanes.

World of Warships was, perhaps, the biggest undertaking that Lesta Studio had ever been involved in. Since the studio's inception, they had worked across various forms of media, not just games, and have been involved in TV, film and mobile. Previous titles had kept with the nautical theme: »Pacific Storm« and its standalone expansion »Pacific Storm Allies« were both dedicated to the Pacific War, during World War II. Taking on »World of Warships« meant that a company which had been an outsourcing studio would be solely in charge of a huge, AAA title. Thankfully, St. Petersburg is rich in naval history, meaning that Lesta Studio was the perfect location to create »World of Warships«.

»World of Warships« was a natural course in Wargaming's »World of«-series. First came tanks, then warplanes, so warships was the next obvious direction. As »World of Warships« Director of Global Operations, Ivan Moroz put the emphasis on not cloning previous success, but ensuring »Warships« was its own entity.

»There is a rich legacy of titles,« said Moroz, »so our goal when creating World of Warships was not to try to emulate World of Tanks or World of Warplanes, but do something that would stand by itself, offer its own unique style of combat and features. By design, warships battle differently, so the blueprint for gameplay had already been partly laid.«

However, Moroz did not disregard the fact that Wargaming's previous successes meant that it has a thriving and passionate player base, who would, of course, be eager for a blend of engaging action and RPG elements.

»Another of our goals was to create a game that will appeal to those who have already played Wargaming's previous titles, but at the same time make something new,« said Moroz. »We preserved the main principles of earlier games, combined them with our own ideas and direction to create a unique project.«

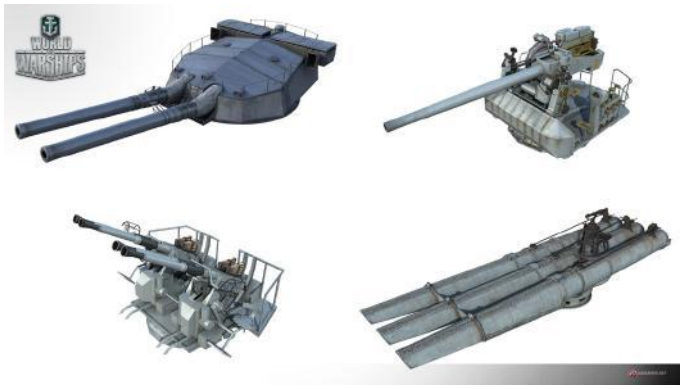
Adapting Combat

Combat is a cornerstone of Wargaming titles. Players are used to deep combat, mixed with strategy, across environments that need to be adapted to. However, there is a difference in the approach to »World of Warships«, which had to offer a new way to play to the player.

»Naval warfare isn't land or aerial skirmishes,« said Moroz. »A different kind of dynamic is required. Obviously, ships are much slower and controlling a warship is more complex than a tank. We've always described World of Warships like chess: you need to stay ahead of your opponents, formulate a lasting strategy that will unfold as the battle progresses.«

Taking into consideration the need to offer a unique take on combat and the slower nature of warship warfare, another design tent pole was in how these complexities could be streamlined for the player. Moroz noted the importance of creating a game that allowed players to jump in and begin having fun with.

»Accessibility was another important aspect, which, again, wasn't done simply to stay in line with Wargaming's other titles, but so that the game can be enjoyed by as many people as possible,« said Moroz. »We know naval warfare is complex, so it was stripping it down to the most salient parts: vessel mechanics, artillery control, RTS controls if we take into account aircraft carriers. It had to be a game that someone could get their hands on quickly – especially when demoing at booths – and start playing, but most importantly, having fun with, quickly. These formed our tenets of what had to make it into the game.«



»World of Tanks« as well as some turrets and other weapons that one can find onboard of the ships in »World of Warships«. Remarkable: One of the turrets has about as much polygons as a typical tank.

With these points forming the basis of what »World of Warships« would become, the next stage was implementing them to form a game that would stand out not only in the Wargaming universe, but the MMO market.

The first question that Lesta asked themselves when undertaking the actual design of »World of Warships« was: what kind of game is this going to be? »The other titles in Wargaming's catalogue were, typically, about close command of one vehicle,« said Moroz. »When we strip everything down to the bare elements, the nature of naval warfare is different, especially in the sheer scope and scale of what we are doing. We needed to take that strategical and methodical dimension of gameplay and basically blow it up to match the scale and size of Warships.«

About Size and Balancing

»World of Tanks« and »World of Warplanes« were somewhat more »insular« worlds. Wargaming and Lesta had never worked on something of this scale before, which took into account the vehicles, levels, and overall atmosphere. Ships are far more complex. A Churchill tank is around 24ft 5 in length-wise. An Iowa-class battleship is around 887ft overall. This is not even taking into account guns, cabins, turrets, decks, rooms, and all the accessories.

»There are a lot of items to model, design, and render in the game,« said Moroz. »And, let's not forget, this has to be in much higher detail. On average, any ship consists of as many polygons as 30 tanks in the non-HD version of World of Tanks. This means that any ship's turret has the same number of polygons as one tank.«

As previously mentioned, combat was another area of great discussion. Despite there being a wealth of minutia in warships, Moroz and Lesta decided that they needed to streamline the game if they had any hopes of making it coherent for themselves and the player.

»Basically, there are a great many of warships out there,« said Moroz. »We needed to distill these multiple classes into just four. While the military enthusiasts out there may take issue with it, the reality was that we had to sacrifice some historical integrity to make the game fun. By having battleships, destroyers, cruisers and aircraft carriers, we were able to introduce four distinct playing styles. This decision helped to create a harmonious battle environment and also added another layer of strategy to the game.«

World of Warships' time period was also another important factor. »Starting from 1900 served as the best point for World of Warships because it was when we saw the transition from steam-powered vessels,« said Moroz. »This period was in-keeping with the World-of-era, so there's a connection running through each of our series titles. However, we felt the need to extend the time period – both previous and future, because from 1921 to 1938 there was a so-called vacation period with fewer large ships being built. With an extended period, we were able to include iconic vessels that could also be balanced within our world, creating a lot of interesting possibilities for our players.«

The sheer size of naval combat obviously extends to the types of environments that the player will find themselves battling across. For Ivan and Lesta Studio, it was about creating the right balance of space and interesting level features to keep players engaged.

Making vast Landmarks Fun

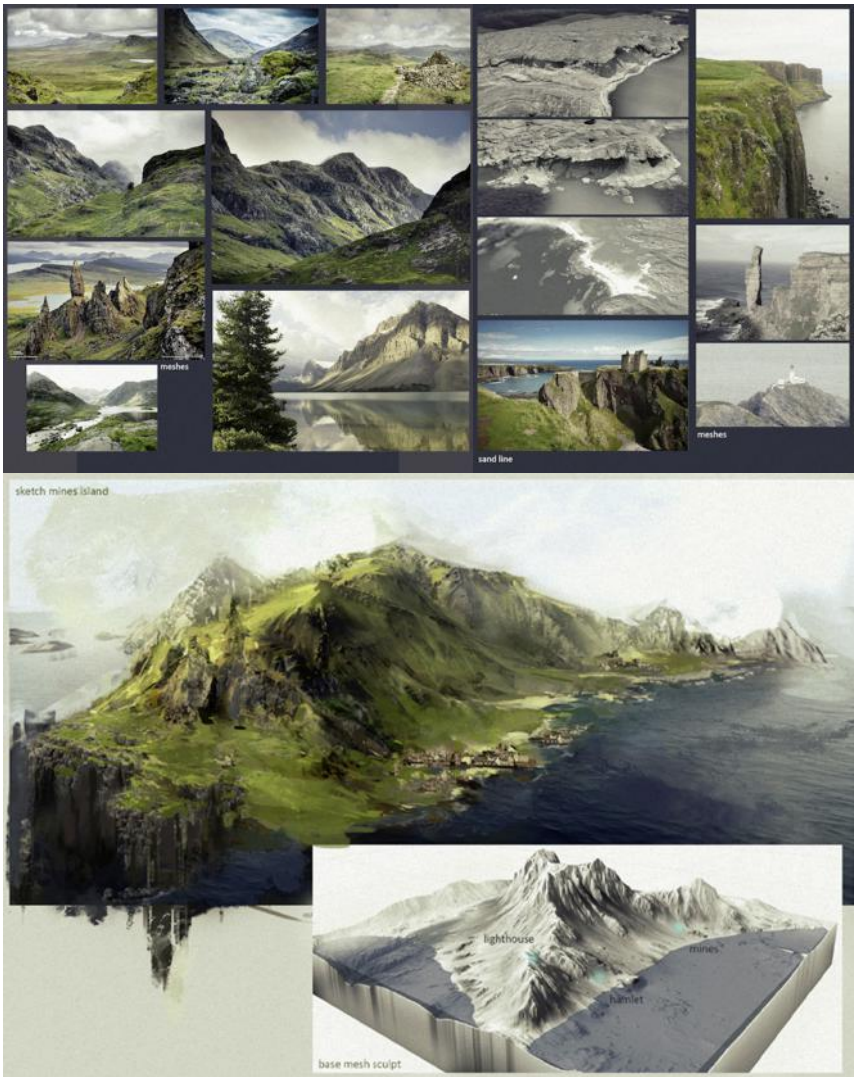
»The ocean is vast,« said Moroz. »Sure, there may be a few inlets, atolls and islands, but the mechanics of battle differ from land-based combat. You could say that it's a little similar to Word of Warplanes. You can't simply stay in one spot and hope for the best, you have to keep moving. It lends itself a great deal to our notion of creating a strategic but dynamic battleground.«

However, each level needs to be unique; it needs to offer different challenges and be open for various strategies and play styles. Creating unique experiences for players is a must for Moroz.

»Each level is its own little world, the raw fun, from each playing experience,« said Moroz. »Maps have variety of things to offer to a player, they each have their own goals and way to guide the narrative of battle. Players will see levels inspired from the Pacific Ocean, Atlantic Ocean, North Sea, and South China Sea, so there is a lot of variety. Small islands, the islets, the little things you'll find cruising around, they all add to a story that you are creating. We want each battle you are a part of to add to the legacy you are creating and be memorable. That's how you make not just a game, but a lasting experience.« **Ivan Moroz**

Before »World of Warships« Lesta Studio was involved in TV, film and mobile and developed the game »Pacific Storm« with the standalone expansion »Pacific Storm Allies«.

Those screenshots show »World of Tanks« and »World of Warplanes«, which were the first two games of Wargaming's »World of«-series.



This example shows what kind of inspirations the level designers used to create the map »Mines Island«.

Roman Porozov
is Lead Level Artist
at Wargaming Saint Petersburg
(Lesta Studio).

Roman was born in Sakhalin to a family of sailors, which explains his love of the sea, the cult of Cthulhu and, of course, ships. Games became one of his main interests from childhood on when his father brought the legendary Atari 7800 from Japan. His diploma project in university was called »Concept Art in Game Projects« and, thanks to his passion for computer graphics, as well as for the traditional fine arts, he decided to start my career in the games' industry as a CG artist. Nowadays, Roman works as the lead of the game-levels department which gives him lots of opportunities to make developments in the field of visual content and technology. »World of Warships« has its own unique challenges and solutions which he is very pleased to be a part of along with a great team of professionals – it is the people who make the project the success that it is.

Designing Naval Battlefields

Alongside the vessels in »World of Warships«, the battle arenas we create are key to a thrilling naval experience. Many of the levels you find in the game are inspired by real life warzones and locales, ranging from arctic archipelagos to the Pacific. We want maps that challenge players, offer a lot of room for strategic play, and are visually breathtaking.

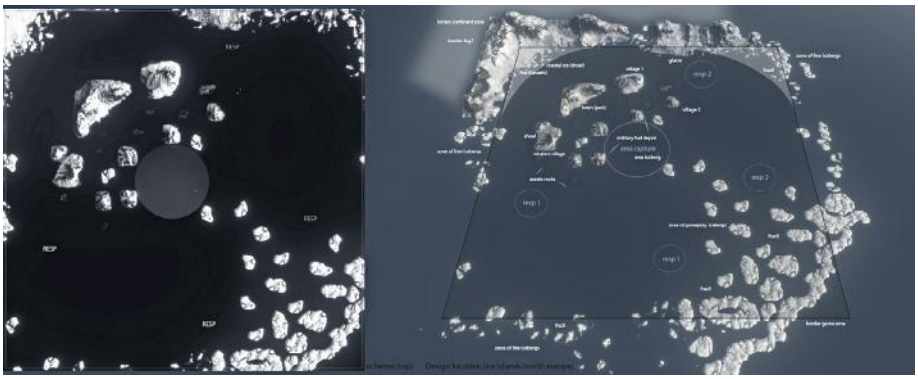
Forming the Battleground

Creating a level for any game is an exciting process, combining the skill and expertise of various departments to deliver a visually stunning environment with character. Each level has its own objectives to fill and must add to the player's experience by distilling the core elements of the game. For Roman Porozov, this was much more than a simple space: it was its own ecosystem.

»We believe that each battleground needs to tell a story, which means that it needs to convey a rich sense of atmosphere and to take the player to a living, breathing space,« said Roman Porozov. »They are places that a player will learn to figure out and tailor their strategy. Islands, islets, icebergs, stretches of lands – you'd think that because World of Warships is a naval game that there would be an overwhelming amount of water. This is something we wanted to avoid for a number of locales. Not only is it visually unappealing, but it hinders gameplay in some instances. It was the same approach we took to game mechanics. You have to stretch the truth a little; we put the emphasis on fun and challenge.«

The process of creating game locations can typically be divided into two main stages: setup and development, which can then be divided into basic steps. For level design in »World of Warships«, Lesta Studio usually works with groups of islands, as they are the main dividing entity in game universe. They form one of the principal gameplay objects. As the project was evolving, specialists in level design, designers and artists understood what technical approach is the best for solving visual and project tasks. All this begins with the initial concept.

»Inspiration comes from many places,« said Roman. »Photo references are great, as well as concept artwork. You'll find an interesting picture and then can let your imagination dream up an interesting layout. However, we always aim to keep ourselves grounded in reality or else the player will be removed from their gaming experience. Movies are also great, because, by their design, it's a visual medium and excellent at displaying interesting environments.«



Each map has its own layout that needs to be balanced so that both factions fighting against each other have the same chance to win the match.

»World of Warships« features 16 different geographical regions which are designed with original warzones in mind.

For every level, we begin with a basic geometry, which is created by the Game Design Department. It's their job to conduct play tests and shape the main gameplay objects. A location can see changes even at the final stage; for example, if a team is constantly winning because the location is unbalanced.

Level Art integrates the work of other departments. This pipeline includes conception creation, creation of production sketches that define setting and atmosphere, forming islands shapes, color composition, etc. It serves as our foundation, including plants, landmarks and other environmental objects.

Once this part is done, the map is handed over to a Level Artist who builds a single visual system, forming an overall picture. We then move to the more technical part: space setting, content checking, collision models and other issues until the level is completed. On average, it takes around one or two months to design, build and release a map. If needed, artists polish the geometry using Zbrush and Mudbox tools.

»A map has to fulfill certain requirements for the players,« said Roman. »They're going to be visiting locations multiple times. These locations have to solicit something from a player: an emotion, a reaction. Players want a unique gaming experience every time, and part of this is offering as many versatile, tactical options as possible.«

Gameplay Determines Level Designs

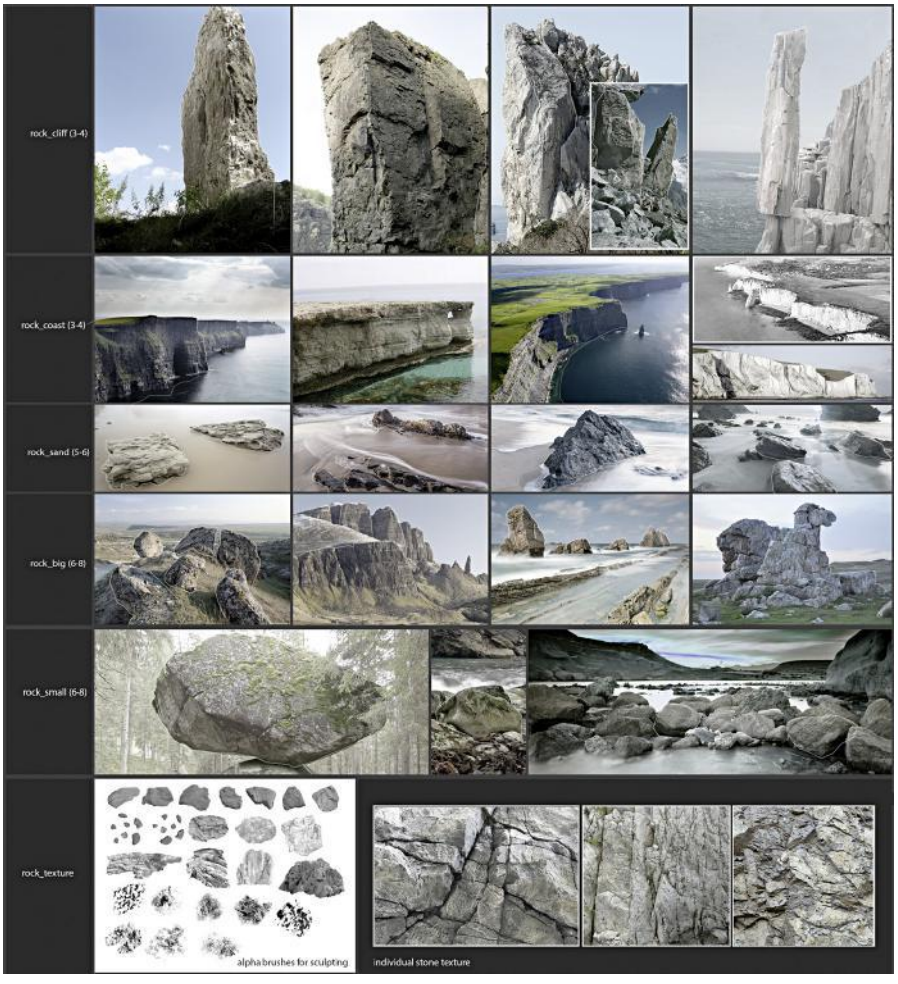
It is important that each locale is a tactically rich environment. Designers have to understand the kind of gameplay they are working with. The seas of »World of Warships« compromise 16 geographic regions, each with their own distinctive features. A setting usually comes down to the selection of one of these regions based on the requirements game designers have for the map.

While the sea is the main battle stage, land elements (coastlines, islands, etc.) are incorporated to enhance player experience and atmosphere. Our Environmental Artist considers a location completed when it has various and high-quality geometry, a rich color pallet and its own atmosphere. Every level has to be a unique experience and provide diversity to the player.

»If we are for strategically complex gameplay, we design a large number of small islands (icebergs, coral islands, stone blocks),« said Roman. »If we aim at open spaces, we use a small number of physical obstacles. World of Warships has complicated inner mechanics; we can even have a playable prototype on a completely open map (limitless ocean).«

Stepping back from the elements that compose each level in »World of Warships«, the camera is an integral component of a player's gaming experience. However, there came a point in the development of »World of Warships« that this had to be completely redesigned.

»Due to the nature of combat, our levels, how we knew the game had to be played, we had to change the camera,« said Roman. »This resulted in a major redesign of some locations. This is because the World of Warships game universe has vast spaces that affect the design, game mechanics and distances between warships. We managed to preserve the atmosphere of massive ships and scales by rearranging the setting of the game's cameras. This helped us see the gameplay from a new angle. It was one of the best decision in terms of visual and design. Overall, when combining all these components, it was thrilling to see just how well they all complemented each other.« **Roman Porozov**



Another set of inspirations that the developers used to created authentic looking rocks.

THE CREATION OF AUTHENTIC WARSHIPS

Even if World of Warships is »just« a Free2Play game, Wargaming puts a lot of effort in the creation of all the military equipment that is in the game, which meant thousands of photos, blueprints and several months of work for just one vessel.

Aleksandr Zotikov
is Senior Technical Artist
at Wargaming Saint Petersburg
(Lesta Studio).

Aleksandr is responsible for integrating new content into the game client. He also works with technical artists and engineers in the development of new tools, and helps to streamline the Art Department's processes. Previously, Aleksandr worked in 3D modeling and created warship models and textures for them.
Aleksandr joined Lesta around three years ago and worked on several educational and scientific projects before coming aboard »World of Warships«. Though starting in a 3D modelling role, he has since transitioned to scripting and programming, which has provided many new and interesting challenges.

Sergey Gornostayev
is Historical Consultant
at Wargaming Saint Petersburg
(Lesta Studio).

Sergey manages Lesta's cooperation with a number of naval museums, archives, professional naval and maritime communities, and ensures that they provide the dev team with references on warship designs. Sergey was interested in utilizing his significant historical background in new ways, so he joined Lesta. He has previously worked in the historical faculty of Saint Petersburg State University helping with the organization of different conferences. One of the fondest memories of his career was meeting with a naval architect who was in charge of the restoration of the Aurora cruiser from 1983-87.

Players expect a number of elements when playing a Wargaming title. Varied and historically accurate vehicles are at the top of their list and draw them into the game. Like Wargaming's other titles, a great amount of time is spent searching through archive materials, collaborating with historical consultants, and modelling vehicles to ensure that there is the right balance of gameplay and authenticity.

With »World of Warships«, vessels amounted to four distinct classes: battleships, cruisers, destroyers, and aircraft carriers. Creating these vehicles meant not only a distinction in how they played but how they appeared.

»Their design informs the perception a player has of their chosen vehicle,« said Aleksandr. »They expect battleships to be giant goliaths of sea and cruisers to be nimble vehicles. Getting this right from the beginning, as well as ensuring the historical buffs who play the game are satisfied, is a goal that we are always striving to achieve. It comprises many different aspects of design, from the first blueprints discovered to eventual integration and modelling.«

Historical research is where this process begins. This means working with Lesta's historical consultants, whose job it is to help gather all the information needed in going forwards. They will visit archival centers across the world, search through blueprints and records, going through thousands of pages to find what is most salient.

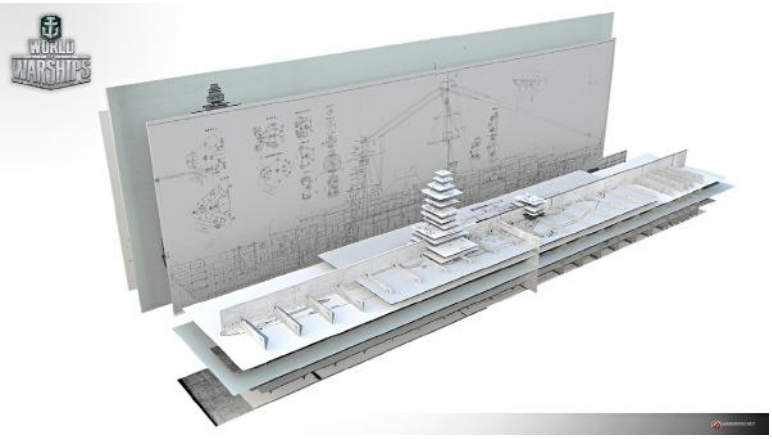
»So far we have cooperated with US and Japanese museums most, because warships of these two nations were the first to be added into the game,« said Sergey. »In the USA we work with the Pacific Battleship Centre (the USS IOWA), the Texas State Park System (the USS TEXAS) and the USS Kidd museum in downtown Baton Rouge, Los Angeles.«

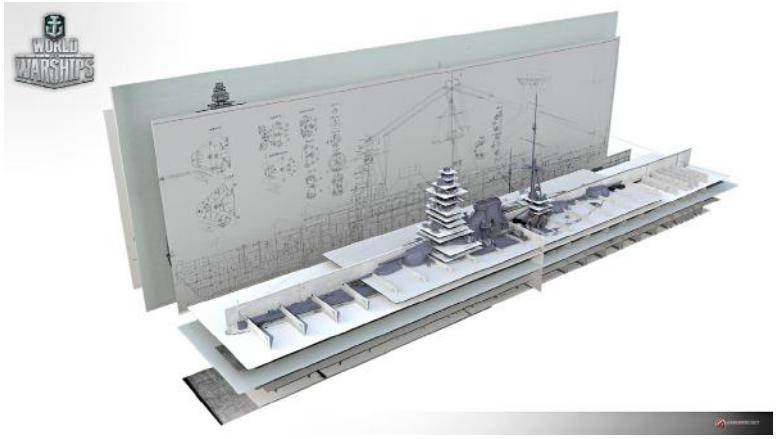
Archival data (photos, schemes, etc.) is often not enough. To research a vehicle's construction in every detail, researchers need to see warships with their own eyes and engage in field work. Overall, when working on the U.S. national line, historical consultants and Lesta employees visited close to ten warships-museums across the U.S. and took several thousand photos.

In Japan, the team visited the Kure Maritime Museum (also known as the Yamato Museum) in Hiroshima. The museum has the Yamato ship replica duplicated as accurately as possible, based on original drawings, photos, and underwater images taken by submersible surveys. It also showed the history of the naval base in Kure, shipbuilding techniques, and offers hands-on lessons in the science of water buoyancy and other principals of boat making and sailing. For Sergey, it offered a fantastic opportunity to see vessels that would be in the game like never before.

»Most importantly, there we could access the museum's archive,« said Sergey. »It boasts dozens of materials such as engineering draw-

All the work that Wargaming is putting in creating the warships for their game can easily be recognized ingame, as all vessels show a lot of details.





Before a ship is being created for the game a team of researchers visit museums and archives to get thousands of photos and blueprints. Those are used as patterns to have authentic vessels in the game.

ings and photographs. Here we made copies of the original scheme of Japanese's warships, including some rare models. What added to the overall experience was the fact that we were accompanied by the museum's director, Kazushige Todaka. He's the man behind the famed authentic exhibit of objects recovered from the legendary sunken Yamato battleship. Actually, we have a rule: if a warship we plan to introduce has survived, we have to visit it before getting down to the actual development of a 3D model.«

In Russia, Lesta works closely with the Central Navy Museum in St. Petersburg, Russia. It has recently moved to a new building that is bigger than the previous location, where it can showcase its collection of 1,500 items to the fullest. However, the most valuable thing for the team is that the museum has presentation models of naval warships, including a rich collection of designs and construction layouts. All of these are used to create the Russian national line that is already in the works.

As well as the expeditions across the USA and to Japan, Lesta has been to a number of naval museums across Russia and in China, such as the »Mikhail Kutuzov« artillery-cruiser museum in Novorossiysk and the missile destroyer »Anshan« (the former USSR destroyer »Rekordni«) museum in Qingdao.

Each research trip is a comprehensive expedition: the video team films the warship for a series of »Naval Legends« documentaries that Lesta produces, the team gathers documents for the presentation of a ship's history to the player community, and, of course, it researches the vehicle's model to reproduce it in the game. To manage the latter, there is always a 3D modeler on the expedition team. They take photos of each meter of the vehicle, including pictures of its small parts (dingings, mounted elements, dropping davits, equipment on the Navigation Bridge, etc.). If a warship-turned-museum has an archive, the team makes copies of what is in it. Photos are then used to create an in-game 3D model.

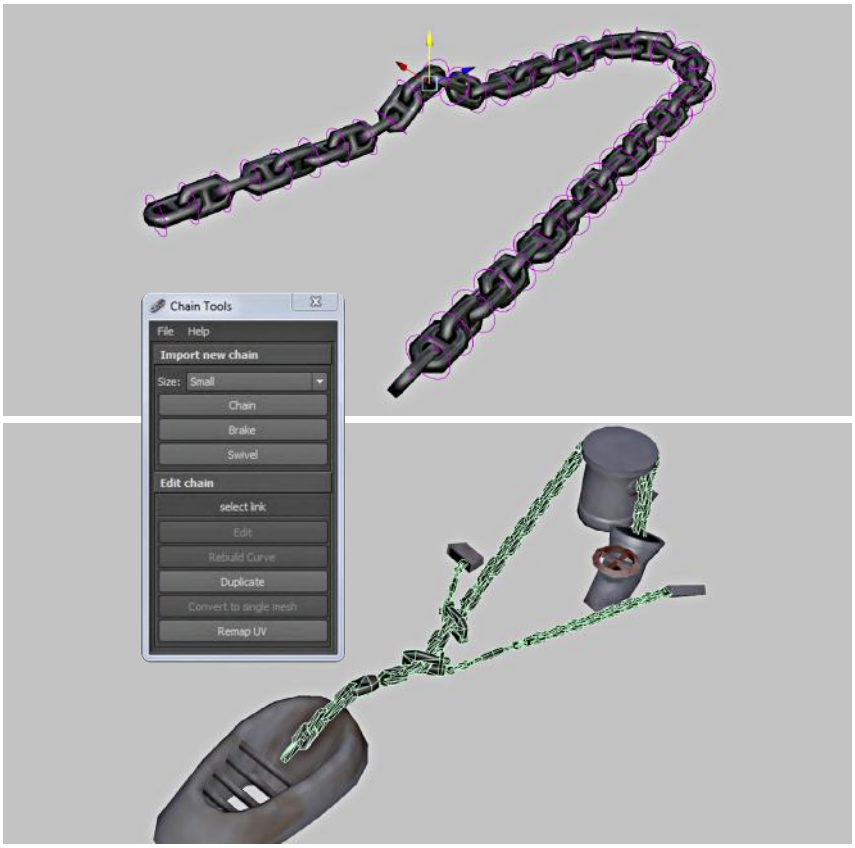
From Research to Design

Lesta began with USA and Japan because the two countries were the vanguard of naval warfare between World of Warships' chosen time periods. Between 1942 and 1945, the U.S. and Japan were the two superpowers fighting against each other for domination in the Pacific. Both countries invested heavily into their fleets to secure the victory, which they had started before World War II.

From as early as 1935 Japan had set its sight on the Dutch East Indies' oil reserves, which resulted in a growing tension between the nations. After the Japanese moved into Indochina in 1940, Roosevelt stopped U.S. shipments of steel and oil the Japan shutting off the air supply to the Japanese army.

»Both countries were nurturing plans of attack for about a decade spending a good

This image shows an example of how the team is using blueprints to design a ship, which can take months of work.



Even the smallest details are modelled for each ships and sometimes the team has to improvise on those, as information is missing.

share of their economic recourses to strengthen their fleets: increasing ship production, fostering research and development of naval technologies and weaponry,« said Sergey. »By the time the Pacific War happened, each of the two had an impressive collection of state-of-the-art naval warfare. These were 1930–1050s' finest, and it's only natural that we decided to add them first.«

The choice of these two nations also meant that the technology used in »World of Warships« for the Tech Trees upgrades could stay true to life. There was a real historical basis to inform design decisions, while being able to include a few of their own. When it came to the actual design process of the vessels, Aleksandr knew that this process would be far from traditional.

»A warship is a huge entity, which means there are a lot of points that require close attention,« said Aleksandr. »We don't have a traditional sketching stage, because our work relies on historical blueprints and photos. It's all laid out for us. But at the modeling stage we often have to invent the structure and image of certain warship parts. Weapons, radars, diastimeters, windlasses are some parts that require a little imagination and brushwork to get just right. These ships are giant, complex beats after all. The great aspect of the game is that you can zoom right in on these models and observe the tiniest of details that we strive to make historically accurate.«

After the team has, for instance, the blueprints, they can set them up in Maya. The number of blueprints in one scene can total around several hundred. With all this research collected, the main part of the modeling process can begin.

A modeler recreates a ship hull, gun positions, bridges and other components that form a silhouette of a future warship. Afterwards, an artist arranges guns, diastimeters, radars (objects that influence the game parameters) and missing details: windlasses, mooring equipment, fire hoses and even medical lockers. Once it is complete, UV mapping begins when a 3D model is unwrapped on the surface for texturing. Currently the team use PBR (Physically Based Render) which allows them to make warships' textures more interesting and realistic.

»Texturing is one of the most difficult stages,« said Aleksandr. »It's divided into two parts. During the technical stage an artist creates various functional details: decks, portholes, welding joints, etc. At the second stage, we breathe life into a warship; we make it look like it served time on the ocean: scuff marks on deck, traces of waves on board, brush marks, etc.«

At every stage work, Lesta's artists thoroughly examine each model to ensure it is technically correct and is built upon blueprints and photos. When modelling, the number of polycounts and optimization are our top priorities.

»We want to achieve high graphical fidelity, but if we created a game that could only be played exclusively on the highest of computers, then we'd not be severing our audience,« said Aleksandr. »Obviously, we have different graphical settings, but we had to be very mindful of average system specifications to create settings that work for a broad audience. We have certain standards that allow us to control the number of polycounts even on the ships that are incredibly difficult in terms of modeling. For us, it's about providing the best and most seamless experience.«

The timeframe for each ship can vary greatly, from initial design to finishing the full vehicle. There are big discrepancies between an 80m destroyer and huge aircraft carriers which are 300m long. On average, the whole process lasts from two to six months to cover the full modelling cycle.

Battle Mechanics

World of Warships' battle mechanics are one of the cornerstones of the game. It has to extract the essence of the Wargaming formulae, but also offer its own twist, making it a unique experience from the other games.

»For World of Warships, we have what we dubbed the rock, paper, scissors philosophy,« said Aleksandr. »Developing an engaging game about naval combat was a challenge because, in real life, naval combat has very few

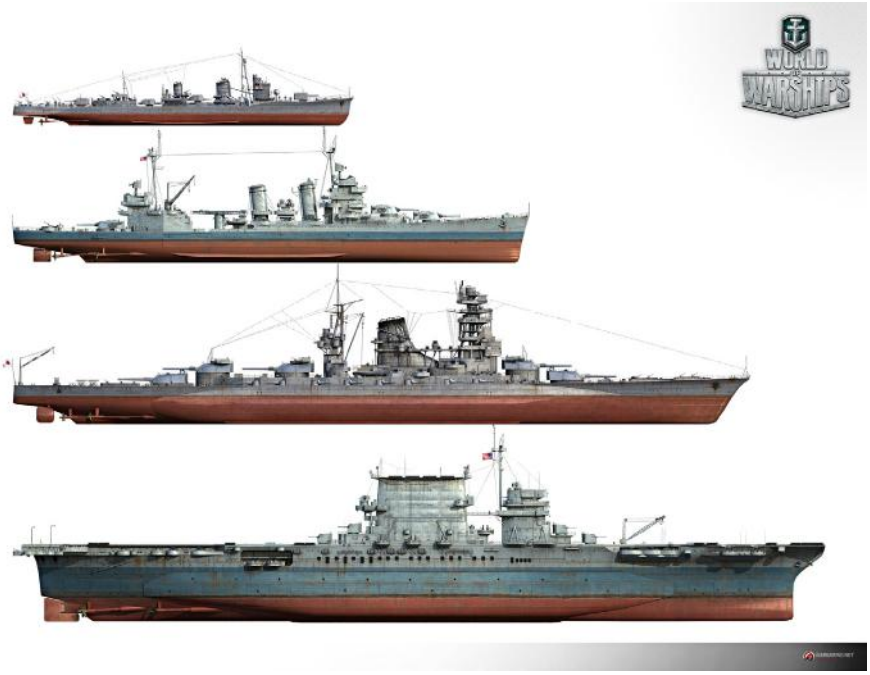
elements. First off, it involves three types of warfare – warships, submarines, and aircraft – each of them with varying armaments: AA guns, torpedoes, marine mines, etc. You also have to keep in mind that the whole mix also includes an ample variety of tactics applicable to each type and class of warfare, as well as strategies explaining how to best use a certain set of vehicles against a certain enemy on a given map.«

This »rock, paper, scissors« approach helped to define the way in which warships interacted with each other, matching one type's strength against another's weaknesses. Battleships are at the top of this »food chain«: they can easily beat cruisers. The latter have a considerable combat advantage over destroyers. Although cruisers and destroyers have similar speed, cruisers are much better armored and have massive AA guns. Torpedo boat destroyers are perilous to battleships. The combination of smokescreens, covetable maneuverability, and torpedo armament makes them deadly to sluggish and slow-going battleships.

While there are the three types of vessel that fit into the combat triangle, the fourth, aircraft carriers, break the mold.

»Aircraft carriers do not fit into the rock, paper, scissors model,« said Aleksandr. »They exist outside the realm. They act as a wild card. Aircraft carriers are capable of delivering prompt attacks and counterattacks and have a colossal offensive capability, which they showed during the Battle of Taranto, the attack on Pearl Harbor, and the Battle of Midway. At the same time, aircraft carriers are quite vulnerable to attacks themselves. A vivid example here would be the sinking of the HMS Glorious by the German battleships Scharnhorst and Gneisenau.«

With this gameplay model in place, the question of further historical accuracy arises, especially when discussing core gameplay mechanics. These are fields where facts, schemes, and archival data are adhered to. This, again, was another area that required streamlining, so not only were vehicles and classes narrowed, but how these vehicles interact with each other in the game. This was another important factor to Aleksandr and the team in the design of »World of Warships«.



A comparison of different vessel types that are in the game and which had to be balanced to ensure the game is fun.

»The balance between historical accuracy and creating a fun game can be at odds with each other,« said Aleksandr. »However, we value gameplay just a much. That's why the game development is about balancing those two out. The biggest step away from realism in the game is the battle session's length and map sizes. In real life, battles can last for days with squadrons of ships plying over the area. This would make little sense in the game: I doubt anyone would stay in game for that long a period. World of Warships is more like a shooter, not a 100 percent realistic simulator game. For us, we stuck to the tenet of narrowing our focus, which broadens our appeal, making World of Warships an exceptional naval shooter.«

Alexsandr Zotikov, Sergey Gornostayev

Those photos show how the designers create the ships for the game which can take two to six month each, depending on the information available and the details that have to be modelled on the vessel.

HITTING THE RIGHT NOTE
SOUND DESIGN IN WORLD OF WARSHIPS

When the development on World of Warships started, only one sound designer was assigned to the project. Today, a team of four works on all the music and audio in the game and had to realize quickly that realistic sound effects don't always do the job.

Artur Tokhtash
is Head of Sound
at Wargaming Saint Petersburg
(Lesta Studio).

Artur has worked in the videogames industry for over five years. Previously, he was a classical musician, pianist, and jazz improviser. After joining Lesta Studio, he first worked on »Nightmare Realm«, and has since worked on »Fright: In The End«. His latest and largest project is »World of Warships«, where he is responsible for the game's soundtrack, including sound effects and music. He also works with audio programmers on the desired technical requirements and fosters the introduction of new technologies and on-point solutions into sound team processes. Artur also collaborates with other teams within development in augmenting and leading feature design.

World of Warships' sound design can be divided into two areas: the epic, evolving orchestral score that accompanies the game and the sound effects that cover the game's world. It encompasses everything from a battleship tearing through the waves, a deafening salvo from a destroyer, the situational scores – if you hear it, Artur and his team have created it somehow.

»There is no universal recipe for great sound design,« said Artur. »If the hair on the back of your neck bristle, if shivers run up and down your spine, if you propagate an image in your mind – it's working. It is structure, form and harmony. Sound design shouldn't be so much ›heard‹, as it should be ›felt‹. The best kind of sound design doesn't pull you out of the game, but enhances your experience, immerses you completely in the atmosphere. The two tenets that we abide by when making the game is creating audio as realistic as possible with software and materials at hand and making effects that could compete with Hollywood.«

Most of the sound effects are taken from existing soundtracks but for the future the team plans to even record shots, etc. on their own.

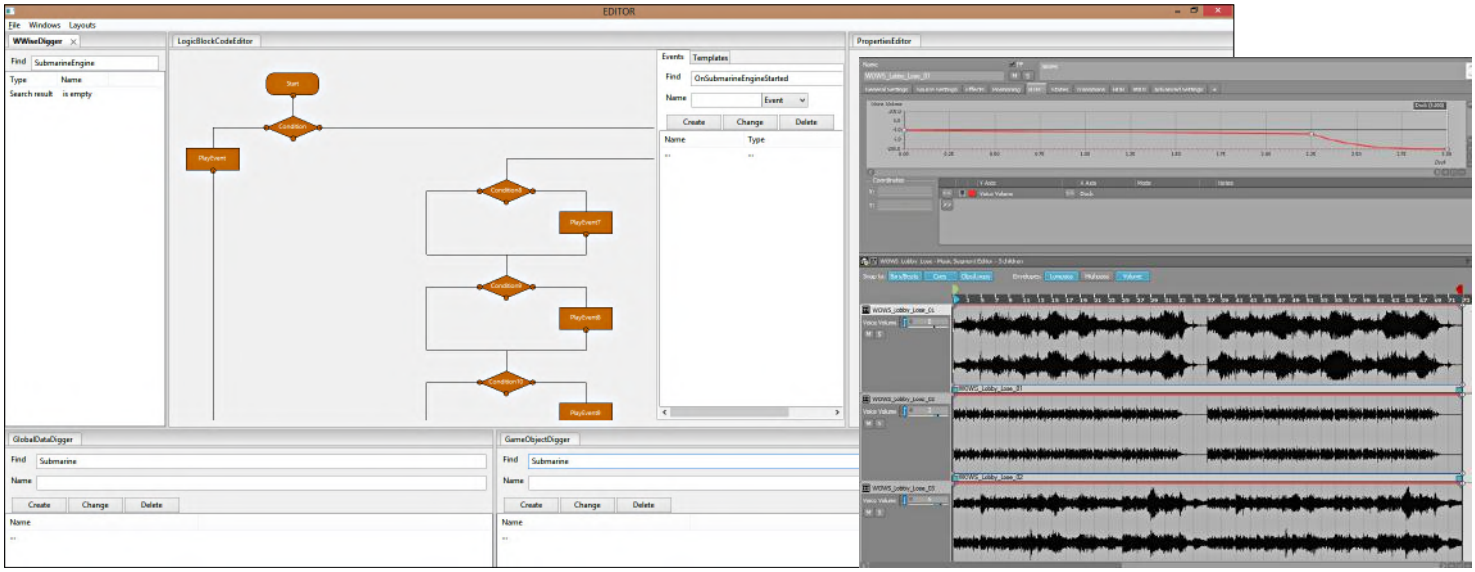
Finding the Right Sound

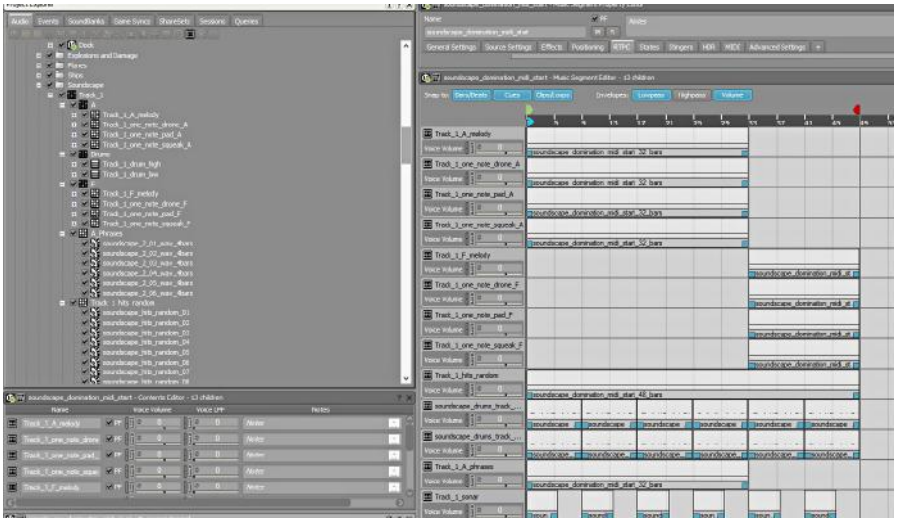
World of Warships' soundtrack is a well-tuned combination of experiments and sound tricks used in previous projects or created in the Artur's spare time. It features an eclectic mix of orchestral and electronic music, has hybrid cinematic sounds and involves a range of elements that are typical for trailers.

»The basis of the score came from studying key musical patterns and their influence on how the action as a whole is perceived by the player,« said Artur. »You need to be able to extract what you need from all these influences, and keep the patterns in your mind, saving a harmony of rhythmic, melodic lines. For World of Warships, we developed a design concept for musical tracks as part of an overall interactive sound system. This principle allows us to reflect and enhance the action on the screen as well as to improve the gameplay.«

The biggest difference between World of Warships' sound and a movie is that, in the game, background audio is shaped in real time. It is pure improvisation based on prepared sequences and various elements. In movies there are not so many plot twists: action unfolds according to a scenario. So, a sound engineer has to pursue an ideal sound within the existing scenario which doesn't cater to possible dynamics.

»World of Warships is a huge game, reflected in every facet of design,« said Artur. »These





Some example images from Lesta Studio's tools with which the sound designers can create dynamic soundtracks that even react on the player changing menus or winning respectively losing a match.

vessels were behemoths of the ocean and that needed to be conveyed in the sound design. We have all seen naval combat in films; we can imagine the rising, orchestral scale that accompanies sleek shots of battleships cutting through the water. As designers and as players, we have certain expectations.«

At the early stages of development, movies and other AAA titles served as inspiration. Watching movies and playing dozens of games helped to define a foundation, shape the way Artur and his team were going to handle the score. With this data, they created a mesh of sound, an idea of what the score should sound like. However, when combining this with previous practice and experience, it did not work for what they were creating.

»At the beginning we intended to use real objects and first level associations (interface sounds that were achieved through seashells, metal sounds, etc.),« said Artur. »However, at a later stage we replaced this with a new system: we started to use elements to create complex sounds from small parts directly in our audio engine. Now a modular sound design is used for World of Warships, which enables the team to decrease the burden on how much RAM the game uses, with a lower sound bank weight. This principle also allows us to produce a number of unique sounds by combining and polishing various elements. They no longer used standard realistic sounds and began to implement effects that have modern electronic roots.«

The Biggest Challenge

Authenticity is a big challenge in audio design. »World of Warships«, as well as other Wargaming titles, have a strong historical backbone, which presents a couple of interesting factors.

»Players expect our sounds to be realistic, but most of them have never heard the salvo from, say, the Yamato in real life,« said Artur. »There is something intrinsic that a player can detect whether something sounds right or not. The notion of realism in media differs a lot from what we know in real life. In movies, we are used to effects – gunfire egregiously so – to be overdramatized. For us, it was finding the niche where player realism intersects with what they expect and what they get. Media has informed and shaped our perception of realistic sound, so we have to find and create a balance.«

Every sound has to be real and fit the sound experience of every player, something that Artur sees reflected in real life.

»Think of any chase scene or car crash in the movies,« said Artur. »If you have ever been in a traffic accident, you know how it sounds: it's a very dry thud, a crunch. In a movie, in a game, you'll hear a bunch of examples of realistic sound design that nevertheless won't have much in common with reality. Every sound is intensified and enhanced, slightly exaggerating what matters most for our perception. That's why each time we collect feedback on new updates we pay close attention to the way people define a level of reality in game.«

However, at the same time a single high quality and authentic sound is not enough to reach full sound consistency. »World of Warships« is a huge system where all elements are closely connected, and clear, crisp sound is an amalgamation of every sound.

»We use a variety of sound material for World of Warships' soundtrack,« said Artur. »There are licensed tracks from our archives, as

Using a real instrument for the composition of the soundtrack is a rare occasion as most of the tracks are done with software.

well as tracks we record ourselves. The recording is done both at the studio and on site. As far as equipment is concerned, we use Rode mics and recorders from Tascam and Zoom. Talking about software, the team works with Steinberg's Cubase / Nuendo and Reaper from Cockos Incorporated to create sound bites. The next step is merging them together and adjusting, which is done in WWISE. So far, we have never recorded real warships' sounds ourselves – we used licensed sound tracks, but we are planning to do it further along the way.«

Delving deeper into the composition of individual sounds becomes a multi-layered process, composing more than just the one sound a player may typically hear. This process is divided into teams so that it becomes about what the player hears and what information needs to be conveyed to them.

»Creating, say, the sound of gunshots is a multistage process,« said Artur. »First off, sound designers manage ›attack‹ and ›gunfire‹ layers, because these are not just effects: they inform players about the caliber of the weapon. The ›attack‹ sound prevails over the overall theme music of the game: when this layer is being played there's a ›ducking‹ effect that allows to hear each gun in the gun mount. For this layer, we also use generated impact effects, and their frequency is unique for each gun caliber. As for the ›gunfire‹; we use the layered cake principle: sound is designed by layering audio elements one upon the other, then this ›cake‹ is equalized and adjusted to each other to create surround sound. Staring with v. 0.4.0 (the Open Beta version), we integrated this effects into the 5.1. Surround sound.«

When a player is victorious, they hear victory music that has its own tonality; even the interface sound changes in order to fit the music.

»Even when the music is turned off, the overall mix starts to change, highlighting the elements that have less priority when the music is turned on,« said Artur. »When a player and an NPC shoot simultaneously, the shot of a player matters most. We adapt the sound to not only fit the mood, but also what is important for the player's experience.«

Focusing on the player experience means that one of the team's most critical tasks regarding sound in the game is that it must be a part of an overall coherent system. It needs to convey necessary information according to player priorities in order to influence not only how they perceive the game, but also how they react to it.

»As for the interactive music, our system is the combination of changing sound themes and the evolution of each of them,« Artur said. »For example, there's a gameState parameter in the game that tracks players' progress in a battle and adjust the sound according with what's happening. Other parameters are tied to what others are doing, the atmosphere of a certain map, etc. and tweak the audio to resonate with the gameplay. gameState parameter work by either bringing up so-called transitional sound tracks or syncing several tracks the way DJs do. To show the evolution of a certain state we add new layers of sound that change the overall acoustic backing, as well as introduce new sound bites that stand out from the overall theme and signal about important changes in the course of a battle.«

Some parts of the sound is recorded directly, e.g. via keyboard, so that it can be edited later on with the software tools.

Combining Software and Instrumentation

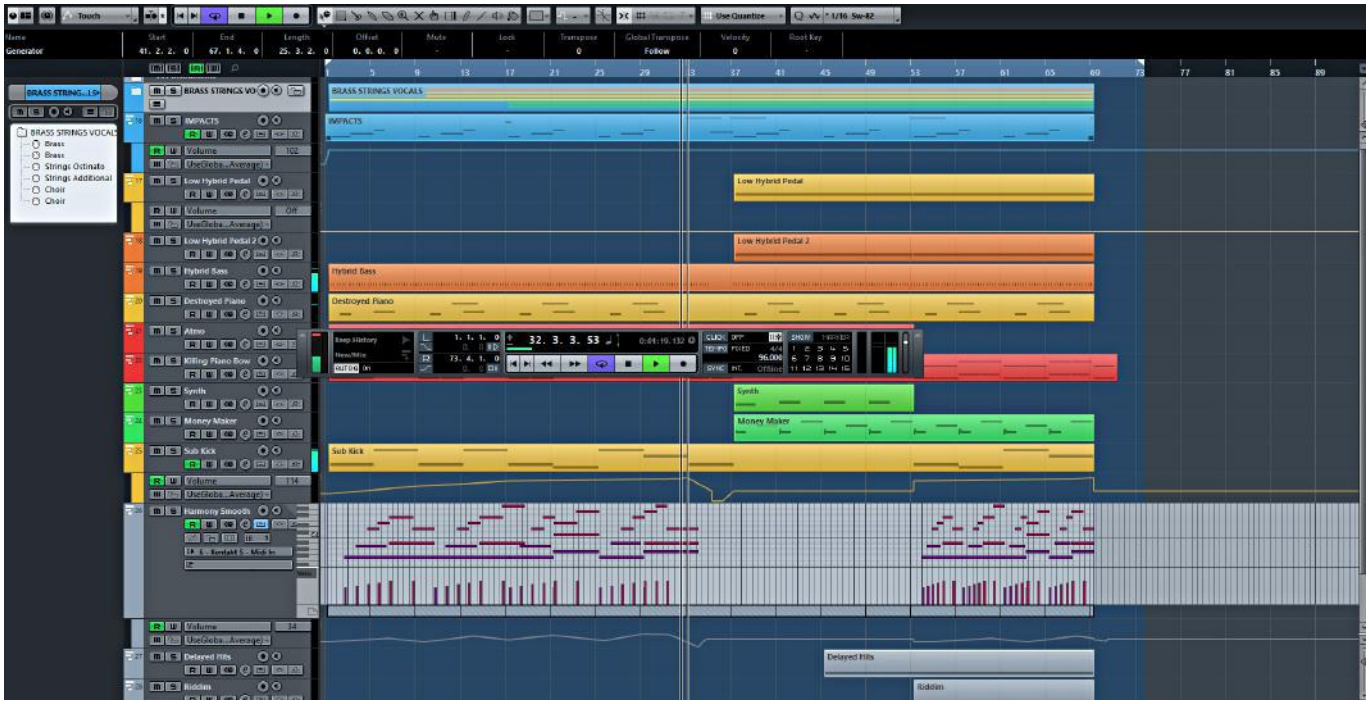
In production, Artur and his team predominantly use Steinberg software (Cubase 7, Nuendo) combined with different sound libraries and virtual tools. When they find the right sound, they immediately implement it into the game and test it out. A big part of making this all work fluidly is the Audiokinetic WWISE audio engine.

»Initially, World of Warships' sound design was done using FMOD engine. Then, we switched to Audiokinetic's WWISE, because it has impressive and extremely flexible solutions for sound creation and sound control. To name a few, I personally really like working with Profiler that provides ample tools for identifying what needs to be improved (faults) and tracking progress. Working with this engine allows us to deliver sound that's at the cutting edge of technology: every time the engine is updated we introduce the latest version into the game using new features to the fullest. WWISE provides the agility that is a must for a game that is as complex and intense: it makes it easier to us to work, create and implement new elements.«

As for the virtual tools, ProjectSAM tools and especially the Symphobia series are extremely convenient. Most tracks in »World of Warships« use Symphobia tools, because they possess a distinctive, high-quality sound. It is important that there is a solid, orchestral foundation to work from. A full orchestrator is the perfect choice for music prototyping and drafting ideas simply because it presents many tools and possibilities for sound creation. Heavyocity was another great discovery: a number of tracks are composed with their tools Damage and Aeon Collection. However, sometimes a program is just not enough. »When we want to actually hold an instrument in our hands and get away from virtual tools, we often go for live electric guitar, percussion, noise effects (e.g. our own voices),« said Artur. »Another important advantage of WWISE is that it's artist driven. In other words, working with it we do not need a lot of help from programmers every time a sound designer creates a new element. Usually, programmers just outline instruments that should be used, and a sound designer acts upon this recommendations and implements his idea into the game in WWISE authoring tool.«

Constant Development

Just like the game is constantly being patched and tweaked, so, too, is the game's sound. »We began with classic orchestral music arranged



Like most other game studios or even movie makers, Lesta Studio uses software to compose the tracks for »World of Warships«.

using a singular horizontal approach toward interactive music,« said Artur. »You hear one piece, and, once a game situation has changed, you hear another piece. Over time, music in the game began to evolve. We switched to a vertical approach, which we first tested in the game's port screen. When in-game tabs are switched, the music changes, additional parties appear and so on. The very character of music is changed: synthesizers emerged, as well as various other original instruments.«

Now the Audio Team is prototyping a generative approach. They have already written several tracks that appear during the game in real time. As the game evolves, the team plans to introduce new and interesting musical features that keep in line with the contextual player approach previously touched upon.

»At the moment, we are implementing the system of generative music of ›Soundscape‹,« said Artur. »It's a combination of music and ambient. For ›Soundscapes‹ the team composes tracks. Then, we create structure of how it works in the game in WWISE: some materials are triggered randomly, some are activated with mini-messages, others by certain sequences of events. When such a structure is being played in the game, it's never the same, because every battle unfolds in a unique way and thus different sound bites are being triggered and played. So, you get an original acoustic backing each time that is created with pre-readied elements.«

However, issues arrive when tweaking an audio system. Players who have a moderate PC/laptop used to have problems with music breaking off because of a huge load on the hard drive. Now the music is read from the hard drive just once, which has decreased the load.

»We apply several approaches to interactive music that are all intertwined and allow a soundtrack to follow a player's actions,« said Artur. »These challenges are connected with technical issues, because we're using quite a complex system. Namely, it's difficult to organize quick and seamless switches between two states. Also, devising systems for situations when the course of the battles changes really quickly is a challenge, too. We have developed a scenario of sorts for the way sound evolves: every music theme has bits that illustrates the transition, leading-motive, evolution, and switches between states. It allowed us to unite all sound elements into one composition that flows changes seamlessly.«

This is reflected in the aforementioned »Port system« where shifting arrangements are utilized. It means that music is situational. As of now, the team is implementing the generative system of interactive music where the soundtrack is formed in real time from small pieces which are closely integrated.

Lessons Learned

Work on »World of Warships« started with just Artur. Now, he has an Audio Team: two sound designers and an audio programmer.

»This allowed me to develop as a manger while continuing to specialize as a sound designer and write music for the game,« said Artur. »It was a time of rapid professional growth. It's about communicating with other specialists, learning something new and sharing ideas and experiences. This experience helped me to switch between the minor and major details more effectively and learn from my mistakes. It helped me to discover new approaches to sound design and technologies. Such a big and complex project as World of Warships was a real challenge. As a sound visionary and a professional, I can apply my skills and experience, broaden my horizons and evolve. You can't let yourself stop.« **Artur Tokhtash**

Just like in movies, the team had to find a good balance between realism and the players' expectations as authentic sounds like shots or the sound of a ship cutting through the waves are not always are impressive.

PIECING TOGETHER WORLD OF WARSHIPS

For World of Warships, Lesta Studios uses an engine that is well known by the team, a lot of tools and special in-house software – that means a lot of work to make all systems work together smoothly.

Andrey Oleynik
is Technical Director for World of Warhsips at Wargaming Saint Petersburg (Lesta Studio).

Andrey is responsible for establishing a link between the artistic vision of the game and its technical implementation. He works closely with other departments to define the technical requirements and restrictions for »World of Warships«. Andrey ensures the product's consistency by negotiating among the various stakeholders such as programmers who are working on the technical design of a game.

The nature of a Free2Play MMO is that it must be able to be played and enjoyed by a global audience, each with their own setups and specifications. The World of Warships' integration process was key to ensuring that the most people get fun out of the game, which means it is a constant battle to optimize, control performance, and create a scalable experience. For Andrey Oleynik, »World of Warships«, while different from Wargaming's other titles, had to reach that same level of excellence as previous titles.

»We were always going to be a AAA title from the very beginning,« said Andrey. »But at the same time we knew that people would naturally draw the comparison with World of Tanks and World of Warplanes, so it's one of the main challenges for the whole team.

With World of Warships, the sheer scale of the project, from the vessels to the levels to the infrastructure, were on a scale that we'd never done before.«

A pillar of creating a AAA game meant it not only had to succeed in what the player experiences, but its integration had to succeed in several key areas.

»One of our main goals is to run well even on very old hardware,« said Andrey. »There are two conditions for good optimization. First, you should constantly control you performance. We have many developers doing hundreds of changes daily, which means that performance issues can crop up, and we have to be attentive of that, be adaptable. Second, all performance critical features should be scalable. The gap between our lowest and highest configuration is huge. It is often impossible to make a feature exceedingly fast, so we have to think intelligently. You need to make a feature replaceable with a simplified one or persuade your artists to create simplified version of content. Often, artists don't want to compromise.«

This is a continual process where three main checkpoints are adhered to for every content pack and feature:

Lesta Studio uses Wargamings in-house engine called BigWorld – which is also used to bring »World of Tanks« and »World of Warplanes« to life.

- The feature or content pack requires separate performance budget tests before being integrated with the trunk.
- It then goes through a separate game client performance test after trunk integration.
- Finally, it goes through an overall client performance test before going to a Release Candidate and before a Candidate becomes the Release.

Within these tests, there is a constant battle between balancing a good-looking and good-performing game.

»It's a very difficult task, and every time it's about finding balance between visual and performance quality,« said Andrey. »We have strict internal budgets for a wide range of metrics for every spec. We assemble all the system requirements in testbed. New functionality can then be implemented immediately in light of the performance of different PCs. When developing these functions, we test them in different environments and scale them to our target configurations.«

One of the largest parts of the integration process is the BigWorld engine. This is the engine that runs through the heart of the majority of Wargaming's titles: »World of Tanks«, »World of Warplanes«, and »World of Warships«. This is a ready-to-go engine that offers very good customization options. Because many teams in Wargaming have used it before, there is a great catalogue of knowledge that makes the integration that much easier. Game engine success is defined by the number and quality of games based on that engine. It also depends on the game being created and the requirements needed.

»BigWorld is an MMO engine,« said Andrey. »One of the major parts of an engine is tools. They affect how fast you can develop content or find bugs or prototype new functionality. Tools can cut your budget in half or multiply it by ten. The client-part was slightly outdated at the beginning of World of Warships' development, but server-side it was always excellent. It's proven with millions of CCU worldwide on World of Tanks, so we never had to worry about anything server-side. Another boon is that we also have a lot of additional possibilities for sharing technology by using one engine with other Wargaming titles. However, we also use some large third parties, such as Python, Scaleform, Wwise. In addition, we use a lot of self-written code on the Client-side specific to our project.«

It's all about Tools and Performance

With a huge game like »World of Warships«, there are a great many features that everyone involved wants to include in the game. However, time constraints and actual implementation often push many elements back until further updates, or they are simply left on the cutting room floor.

The ships are modelled in Autodesk Maya. An additional software is needed to convert those into a format that the engine can work with.

»There are tons of features that will make it into the game at a later stage,« said Andrey. »As for the immediate future, there is, for example, SpeedTree technology. This a toolkit used to create 3D animated plants and trees for games, animations, visual effects. In the state in which we received it, SpeedTree was not suitable for us to use. To get it working, the team had to make a lot of changes, so, at the moment, we are working closely to integrate this feature. One more feature that is not yet ready is Anti-Aliasing to a fuller degree. We've got tons of wires and other thin elements and developing an Anti-Aliasing system that would have decent performance in our case would be a really challenging thing to do.«

With the engine in place, there is other software that proves invaluable in the manufacture and preparation process, such as Maya, ZBrush, World Machine, Mudbox, Vue, Quixel, and Symplygon. The next stage is using these tools at hand that make integration fluid from planning to implementation.

»Making sure we have the best possible workflow in place is key to getting everything running smoothly,« said Andrey. »Atlassian Confluence is the standard for keeping all our

BigWorld Technology

BigWorld Technology is an engine solution that is specifically designed for MMOS and offers server as well as client engines and various tools. Before Wargaming bought the company, making BigWorld its in-house engine, customers like Aeria Games, Userjoy and NetEase were using the it for their games.

For the future Lesta Studios plans to implement SpeedTree so that islands with jungle and forests will look more realistic.

documentation in order. Within it, we can detail new features that are later implemented into the game. It allows us to keep the entire team on the same page for the product's schedule and roadmap. Things like Dark Data are nearly eliminated. On top of this, we have Atlassian Jira. It's a software for bug tracking that QA finds, and it's easy for us to keep track of.«

While the BigWorld engine and other tools are a large part of the process, there are also many more programs utilized by the team, ranging from modeling software such as Autodesk Maya, an In-house 3D exporter/converter to adjust the format of 3D models created in Maya to the one accepted by BigWorld Engine. There is also BigWorld's World Editor to create game locations, an in-house Ship Editor, which configures ship parameters and balancing. Finally, there is an in-house ContentCatalog that allows 3D-Art, LA, and QA teams to verify quality of new content for ships and maps.

»It was integral for us to have a set of tools and software at our disposal that could satisfy the needs of our Artists, Developers and Game Designers,« said Andrey. »We have spent a lot of time developing our pipeline. Our models are extremely complex: they could consist of up to 400 meshes so the pipelines and distribution of work could have been a real pain. We are improving it all the time and currently it's quite robust and we are very close to start liking the whole process.«

This a multi-stage process which needed constant refinement to reach a stage where the team could use it effectively. Due to the difference in software, parameters and process in use, it was often complex and time-consuming.

»Our standard exporter – BigWorld – supports exports from 3D Max and Maya, and requires a verification stage,« said Andrey. »The fact that the exporter requires that the user has knowledge of the parameters wasn't too obvious, this made the process slow, which conflicted with our verification stage. Basically, the software did not fit with parameters we were using for World of Warships, as each ship consists of a huge number of components with different properties and requirements. This meant we had to implement our own tool. The previous standard meant exporting its own implementation with a large number of algorithms, such as triangulation of polygons, calculating the conversion matrix embedded nodes, etc. We abandoned them and used a Maya API, which significantly improved the performance of the exporter. In our studio, we mainly used Python, but Python is not suitable for handling large binary data – such as container tops (vertex buffer), containers vertex indices (index buffer). D.Data Model and serializers such containers were implemented in C++ as a library, which was a natural 'fit' to the data model in Python. Now, all business logic is implemented in Python. You have to make software work for you, not against you.«

On top of BigWorld, dealing with at-scale performance tests and other proofs of concept are integral to achieve a final run-time performance on the target hardware. This comes into play on both the client-side and server-side.

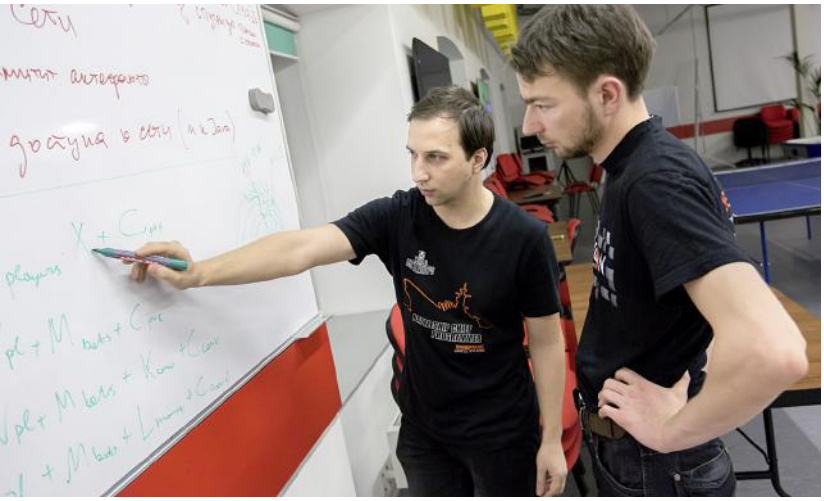
»For the client-side of the game, we have gathered a great stable of testing parameters, with a large number of target PCs,« said Andrey. »We developed metrics and tools that could be created automatically, which allows you to monitor the status of the project in real time. In turn, with this we are constantly aware of and understand the events that affect users. In addition, we regularly update our testbed, adding specific hardware. If we talk about the server, BigWorld, as mentioned, helps us out a lot. We can carry out mass tests with fewer users. In most cases the results will coincide with the real environment. We can simulate the real load on the server by using an external server to process bots, which act like real players – a scary degree.«

Any feature or change that is planned to be introduced has to be tested thoroughly so that the team can make sure that the game still runs smoothly on the lowest as well the highest performance.

New Features Need to be Picked Carefully

Ensuring »World of Warships« is constantly moving forward in areas of optimization and integration is an ongoing battle. The nature of MMO games means that they must be constantly tweaked and improved.

»Before some new features or content go into build, they have to be tested by performance QA,« said Andrey. »At this point, most issues are detected and fixed. MMO games need to keep evolving and adding more and more features with every update. When you are adding something, it costs money. That means that we are constantly identifying bottlenecks and fixing them. It's an ongoing process and almost all teams have a constant optimization stream of work going on.«



Lesta Studio works mainly with Python which was not suitable for handling the large binary data needed for the game. The team therefore had to find a way to make the software work for them, not against them.

Lesta Studio spent a lot of time developing their pipeline, as it was integral to have a set of tools and software that could satisfy the needs of artists, developers and game designers.

To help with this process, different LOD models are used for different types of elements: ships, landscape, static objects, and visual effects. Andrey and his team have tweaked this system to alter the LOD depending on configuration of graphical objects, distance between them, and the size of the screen. Material atlases are used for certain types of particles and objects. This helps greatly in dealing with intensive scenes and low-end PCs both the real-time and pre-production stages, which are then subject to testing.

»To test the performance of content during design, we use two approaches,« said Andrey. »First and foremost, designers have selected a predetermined PC for testing, as well as the agreed budget for features. That is, during development, the designer must provide an acceptable performance at the required quality.«

Budget is another important factor in any project. By discovering ways for the system to work for the team allows them to not only save funds but enhance the gaming experience. »We try to use any available technology to improve performance, but this in no way means we are cutting corners or provide anything less than a AAA experience,« said Andrey. »We use batching and instancing for all models in the same stage of reducing the demand on the draw distance. In our system, the trees together with 3D models from SpeedTree, apply impostors. This allows you to arrange the maps and have an insane amount of trees and jungle-covered maps of any size. For different types of objects we use shaders optimally modified for the specific types of objects, from the water to the system of flags and damage to vehicles. It's common sense, really. Ultimately, World of Warships was the combined effort of everyone on the team, and they all helped deliver an exceptional game.«

Andrey Oleynik

WARGAMING REDEFINING FREE2PLAY

When Wargaming was pitching World of Tanks, no one believed in the creators' vision. Today, the company is leading in the field of Free2Play and explains their learnings from five years of »World of«-games.

Frederic Menou
is Head of Global Publishing at Wargaming.

Frederic Menou has been the Head of Global Publishing at Wargaming since January 2015. Previously, he was the Managing Director of Europe and North America, with over 15 years in the video game industry. He joined Wargaming in July 2011 to build the European headquarters of the company from the ground up, and directs strategy towards the profitable growth and operation of the company.

Free2Play has exploded in recent years. Its home used to be primarily on PC, which a number of Wargaming titles call home, and has found a lot of traction in the CIS region (CIS: Commonwealth of Independent States, with nine member countries from the former Soviet Republics), not just for Wargaming. However, their popularity proved to be a double-edged sword, which led to many attempting to ape successful Free2Play titles with more unscrupulous payment models going beyond freemium. Before implementing its newer model, Wargaming had a similar F2P system as many other games, which Frederic believed has garnered a negative reputation over the years.

»One of the issues with Free2Play games is that they are sometimes viewed as low quality,« said Frederic. »You can download a F2P game on your computer or mobile, and be bombarded with aggressive marketing tactics. The focus on monetization, which can often come off as intrusive, would actually turn players away from their games. We didn't want World of Tanks or any of our products to draw that connotation when they heard about our games. We wanted World of Tanks to serve as proof that a quality and balanced Free2Play game is possible. That is a task that's easier said than done, however.«

F2P models and games have a long history, in online and game development terms. They have become a movement that has transcended the media in which they thrive. The public perception is a dynamic factor that permeates far and wide, which Frederic is well aware of.

»A prime example I can think of is the legendary ›Sword of a Thousand Truths‹ from the television show South Park. It showed how online games were perceived, and was funny because it hit on many true notes. It made me think about monetization, of having to put a lot of time into a game. I looked at other games out there and saw how games will sell weapons with slightly bigger magazines, a slightly greater chance of critical hits or slightly more damage for real world money. Also, cash shops in fantasy MMO games often offer items that increase item drop rates, scale hit rates or grant extra player protection. As a player, I'd be angry if someone out there was getting an unfair advantage simply because they spent money.«

For Wargaming it is important that players who spend money for the game don't have an advantage over non-spending players like better ships, weapons, etc. Instead most purchasable items are of cosmetic nature.

However, there was no doubt that these models were successful, especially in the region that Wargaming had first introduced »World of Tanks«: the CIS region. The »World of Tanks« business model was not only successful, but thriving. As the business progressed, Frederic and others came to the conclusion that this model no longer fit the gaming business they were running.

»The classic Free2Play model, particularly in regards to Pay2Win elements, follows one simple tenet – the more you pay, the greater is your advantage over other players,« said Frederic. »This can result in huge payments from a small number of users and increases a game's average ARPU (average revenue per user) and ARPPU (average revenue per paying user) numbers. You can have a system where top-payers never lose, while those who pay less or don't pay grow dissatisfied with the game. Eventually, many leave entirely and the overall player base shrinks.«

While Wargaming did not explicitly offer a Pay2Win service, it was possible to construe that one player had an advantage over another. Premium ammo, for example, was an area of contention because it was able to bypass a tank's armor. With this, Wargaming saw that they were actively dividing their player base.

»Our original F2P system was commonplace for the rest of the industry,« said Frederic. »At the time, F2P was growing at a phenomenal rate in the CIS region, which was where we first launched the game in 2010. We had a great response to the model, and it was working very well for us. We're a company that delivers Free2Play online games. But we believe that you can't provide a truly AAA Free2Play experience without absolutely making sure all combat options are free of charge to all players.«

An example from »World of Warships«: The player can purchase an additional slot for a ship for 300 dubloons. In addition, dubloons can be used to progress faster as they can be exchanged into ingame currency (which can be gathered by playing matches) to buy equipment for the ships.

Free2Play 2.0

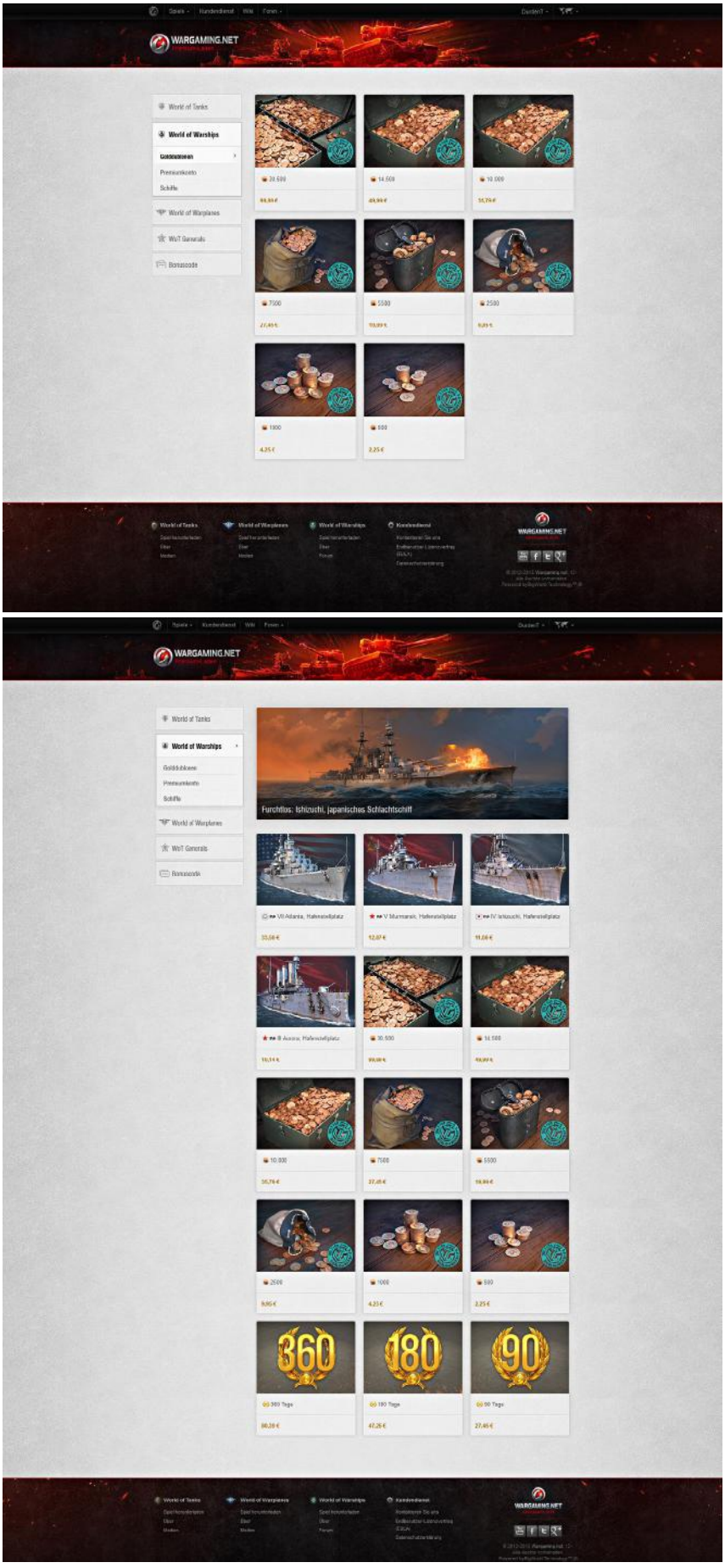
This new model did not just run through one game, but extended to the whole of Wargaming's company ethos. Wargaming's previous monetization model strayed away from putting the player ahead of revenue.

»You are creating a divide within the community,« said Frederic. »World of Tanks and the other titles in our stable are competitive games at their heart. To us, competition means that it's a player's skill that should be winning them the game, not something which they purchase. Our version of Free2Play, in essence, is putting the emphasis on skill. By ensuring that every player out there has the same advantages, we can foster a stronger playing ecosystem that not only makes current players happy, but attracts new players to our games. The Wargaming monetization system is built the other way round. Deep gameplay and great replay value provide comfortable and fair conditions for everyone. Our games have no overpowered weaponry and microtransactions don't give users any sort of advantage in combat. Premium items are priced so that players rarely end up having to spend a lot. We don't want our players to feel like it's an experience that only a selected few can afford. Quite contrary, we want the game to embody accessibility and fairness to all players, paying or not.«

For Frederic, Wargaming's flagship title, »World of Tanks«, had to distance itself from poorer freemium models by creating what he describes as »Free2Play 2.0«. The biggest element of this model was to level the playing field for every player.

»The whole idea of F2P 2.0 first appeared in 2011,« said Frederic. »Unfortunately, we'd delayed the initiative because of the company's rapid and unprecedented growth. So, after tackling some internal challenges, we started putting elements of F2P 2.0 to the test in 2012. In-game purchases that were previously only available to paying players were opened up to all players. This included consumable items like Gold rounds, Premium consumables, camouflage patterns, emblems, platoon creation

eSport is an important factor for Wargaming to attract new players and to get attention.



On their website, Wargaming is selling dubloons for which players for example can buy only premium ship, which are not overpowered in relation to other regular ships in their dedicated tier range.

and other features were switched over so that they could be purchased with in-game credits.«

The change from F2P to the new model is not a transition that could be implemented overnight, and Wargaming was keen to analyze the data and regions they operate in to define how this change would affect their players and the market.

»Our analytics team carefully monitored how players reacted to these changes – whether they were newcomers, veterans or clan members. We assumed that the introduction of our F2P 2.0 features would likely cause a decrease in the purchase of premium ammunition,« said Frederic. »That doesn't mean that this stream of revenue is completely severed, more like it is redistributed. Players will use gold to buy credits, pay for Premium account status, or purchase premium vehicles. We have seen that the model balanced itself out, achieved an equilibrium within the gaming ecosystem.«

Know your Market

Analytical evidence also provides great insight into the gaming habits of various regions. For Frederic and Wargaming, the F2P initiative provided valuable insight to mentality of players in different countries. Unbeknownst to them, this newer model unearthed long-rooted perceptions, which Frederic admitted would take time to overcome.

»Asia is a key market area in terms of in-game purchases,« said Frederic. »The way the region has taken to the F2P model in general is incredible. You'll see a great many companies focusing their efforts on F2P in the region, which, of course, changed the public perception, because it has become so ingrained in gaming consciousness. Approaching the market with our business has meant that not only are players trying to understand our model, but companies, too. In World of Tanks, paying is no guarantee of success. We have discovered that this can be discordant with what that region is used to.«

Delving deeper into the regional rationale of the F2P market, especially in China, Frederic saw that player choice is more than the individual: it is country-wide belief that can define a playing style.

»Data showed us that players in China are very rational when it comes to choosing what they want in-game,« said Frederic. »They used to stick to the Chinese Tech Tree, or choose machines that offer the most amount of fun and profit. In China, the government is focused on the prosperity and comfort of its people. This resonates well with what the F2P 2.0 model offers. Obviously, this isn't something that we had in mind when creating the model. However, it's always interesting to see just how a game can resonate with a country ethos. We have already seen World of Tanks clones appearing in the gaming market. We must be doing something right.«

The Importance of eSports

Another key aspect of this new model affects one of the fastest growing sectors within the games industry: eSports. eSports has seen unprecedented growth over the past years, becoming a global platform that has attracted big companies, born its own teams and celebrities.

»Wargaming's continued and growing support of eSports is integral to our overall market strategy,« said Frederic. »We need to keep building a global network of games and services. The launch of the Wargaming.net League, our different leagues, and new eSports infrastructure have given players great tools to hit the pro scene, earn a living off their talents, and offer a fantastic stage to passionate players.«

If any game wishes to break into the eSports scene, then it can't afford to compromise itself by not allowing players full access to all its elements.

»Our new model, which spreads across all of our games, can't compromise a player's ability to fully enjoy the game and hone their competitive edge,« said Frederic. »Our new system will really keep facilitating the development of World of Tanks as a true eSports discipline. Then, from there, we can look at enhancing the competitive elements of our other games. For World of Tanks, we have had, most recently, The Grand Finals, which is our premiere eSports event. The huge success of this event, bringing gamers from across the globe, would not have been possible without our new model. Wargaming is bigger than just games, and that needs to be reflected in the business decisions we choose.«

Future Plans

With »World of Warships«, the next flagship title in the »World of« series, the development of the Free2Play model had to follow and build upon previous iterations. Because the game has a very strong appeal to users, especially in Asia, North America and Europe, the aforementioned system needed to be further refined.

»World of Warships offered a new opportunity to examine how we offer content to our audience and how we provide an exceptional gaming experience,« said Frederic. »The game has received a lot of hype all over the world, but we've seen a very concentrated and passionate fan base in Asia – especially Japan and Korea, as well as in the U.S.«

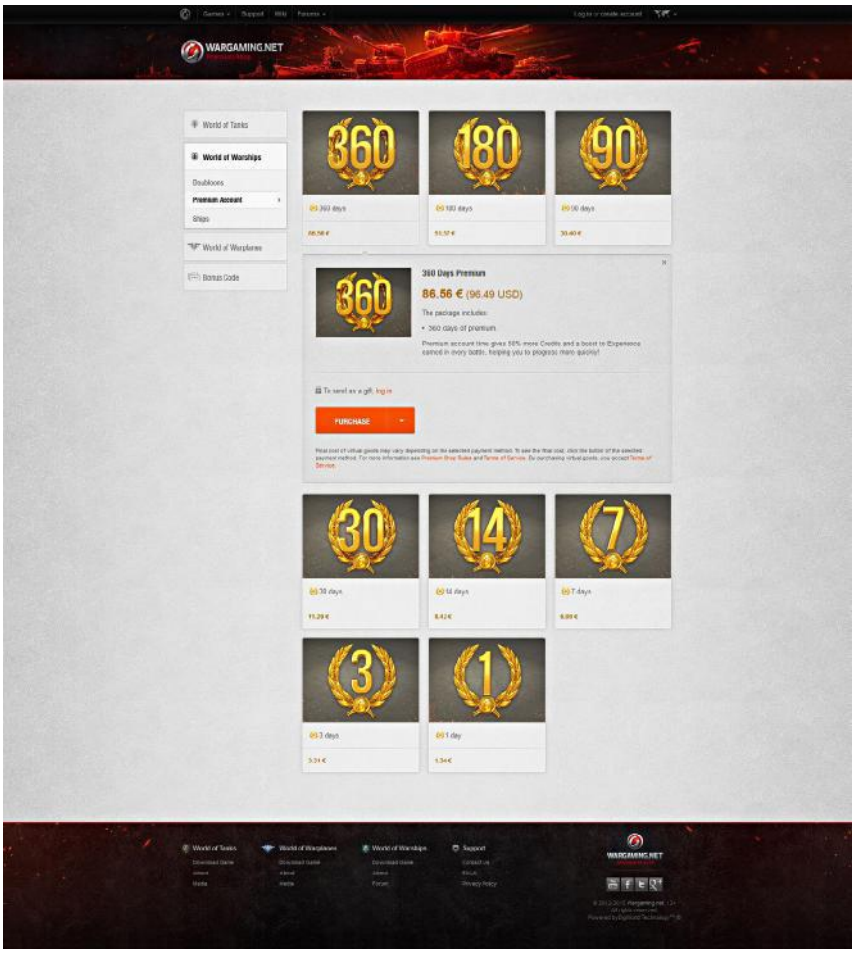
Wargaming already has partnered and collaborated with various other media that extends beyond video games. There has been historical projects, such as »Warplanes to Siberia«, as well as films, such as the motion picture »Fury«. To Frederic, it is important to identify what resonates with players in different regions and provide them with content.

»Europe has taken very well to Warships,« said Frederic. »Here, they are drawn to the vessels we have to offer and their history. We recently implemented the British Warspite, and intend to implement other Premium vehicles. In Germany, especially, they are strongly interested in vessels like the Bismarck, and we're doing all we can to cater to these needs by bringing in focused content players love. In North America, we started off with the American Tech Tree because of the strong naval heritage. Players will also find Premium vehicles, too. A focused approach strikes a balance between monetization and providing exceptional content.«

This focused approach to content also extends to Asia. By consulting data and player habits, the »World of Warships« team is able to deliver precise offerings that appeal to a specific region.

»As mentioned, World of Warships has been very popular in Japan,« said Frederic. »We're seeing that they spend longer in battle and are very interested in the customization of their vessels. Naturally, this leads us to focus on providing features that appeal to them. A key part of monetization is understanding what your audience wants, not just throwing content at everyone and hoping it appeals. In Japan, we know that they have a close community, who is interested in not only the historical side, but the pop-culture side. This means that in future, we may release premium anime-inspired signal flags or camouflage. These will be merely cosmetic, but it's monetization done the correct way. Whatever we are doing, we put what our players want first.« **Frederic Menou**

The Grand Finals of Wargaming's eSport league that were recently held attract players from all over the world, be it to take part in the competition or as spectators - which again brings a great boost for their games and makes the Free2Play model work.



A lot of players are willing to invest in a premium account which boosts the amount of credits and experience earned in every battle.

AUGMENTED HAIR IN DEUS EX UNIVERSE

In Tomb Raider, Square Enix used a new approach for realistic hair for the first time. For the upcoming Deus Ex game, their studio Eidos Montreal improved this technology even further while still achieving good performance.

Uriel Doyon
is 3D Programmer at Eidos Montreal.

Uriel Doyon is a 3D programmer at Eidos Montreal. He studied computer engineering at Ecole Polytechnique de Montreal, during which he made several internships at Matrox Graphics. He joined Ubisoft Montreal in 2004 as a 3D programmer and worked on several titles on the GameCube, Wii and PS3. In 2009, he started working at Eidos Montreal as the lead 3D programmer on »Thief«. He is currently working in Labs, which is an R&D group dedicated to new graphic technologies.

Making great looking hair has always been a hard to achieve goal in the video-game industry. This is why AMD and Crystal Dynamics have teamed up to create TressFX 2.0, which was used in »Tomb Raider«. In mid-2014, we were assigned at Eidos Montreal to improve over Crystal Dynamics' TressFX version for the Montreal studio needs. Our research and work fall under the name PureHair, and was done within an R&D team called LABS. LABS is a group dedicated to advanced technologies, and the work is now integrated in the Dawn Engine.

In this article, we address the topics covered by our PureHair work. Some of which are investigations, solutions or even render strategies to use for hair rendering. Although most of the content presented here relates to hair strands, it is still relevant to first review the different assets used to model hair in the Dawn Engine. Next, we will cover hair strands in detail, since it is the most interesting asset type, covering authoring, simulation and rendering. We will then discuss our experience with different render strategies for order independent translucency (OIT), where we will detail our novel approach based on depth peeling.

Hair Asset Types

There are three types of asset used to model hair in the Dawn Engine. The first and simplest one are hair textures on top of the heads.

»Deus Ex: Mankind Divided« which had its gameplay premiere at this year's E3 will make use of Eidos Montreal's proprietary Dawn Engine that simulates hair as described in this article.

The Dawn Engine uses three types of assets to model hairs. From left to right: A simple hair texture, hair texture plus strands, hair mesh plus strands, hair mesh and the best-looking hair strands.

They are good for making smooth transitions between the skin and the hair. They are also used as a fallback when there are gaps in the other hair assets. On the other hand, they don't give any silhouette and usually have unrealistic lighting.

The second asset type is hair meshes (also called cards and sometime banana leaves). They allow very realistic lighting and handle small deformations well. Their rendering cost is small to moderate, depending on overdraw. Their drawback is that they require sorting if rendered with translucent materials and will create unacceptable artifacts under some deformations. It is also worth mentioning that they take significant time to author.

The third asset type is hair strands, which are rendered as bill boarded cylinder-like shapes, using TressFX geometry. They have an amazing look, handle heavy deformation well and are easy to author. Their down side is that lighting hair strands is hard because they lack neighboring information and are more expensive to render than the other asset types.

In PureHair, we allow some or all of the asset types to be used together to model a character's hair. This allows balancing the costs/benefits of each asset types, with the additional challenge that they must be blended together (and not rendered one on top of the other) when used with translucent materials.

Hair Strands: Authored, Master and Slave

In the end, hair strands are the most interesting asset type for both its behavior under deformations and its high visual quality. As of today, research done for TressFX at AMD gives a strong foundation for both simulation and rendering of hair strands.

Hair strand assets are created using digital content creation tools like »Hair and Fur«, »Shave and Haircut« or »Hair Farm«. With these tools the artist can model the hairstyles and convert the result into splines. Those splines are then processed by our custom plugin called »Hair Station«, mostly to add metadata.

In PureHair, hair strands are grouped into wisps mostly to decouple the rendered hair strands from the simulated hair strands. Each wisp is simulated by one strand and rendered as several strands. We call the simulated strands the master strands and the rendered strands the slave strands (because their positions are defined by their master strand). This paradigm is at the core of PureHair and it affects simulation, rendering and LODs.

When a master strand moves, it moves with it all of its slave strands using standard skinning algorithms. With this logic, only the master strands need to be skinned by the character's bones. The hair can consequently be fully animated or fully simulated depending on the required behavior. This improves performance significantly and also does a better job at preserving the hairstyles. Hairstyles look better with this paradigm because when each rendered strand is simulated, the simulation gravity tends to straighten the hair along the gravity direction. Here the master strands can be straight while the slave strands keep some curvature. The downside is that the hair wisps may look too static under deformation, doing what we call the dreadlocks effect. To reduce it, we eventually added perturbation from close-by master strands.

Shape Preserving LODs

In PureHair, the hair styles are mostly defined by the wisps. Each wisp could have more or less slave strands, but it would not change the overall silhouette. Consequently, LODs are implemented by reducing the number of slave strands per wisp, while increasing their widths. Having less but wider strands increase the performance significantly, especially from afar, where triangle size could become sub-pixel.

Simulation and Collision

As previously stated, the master strands are simulated using TressFX-like simulation. The most significant issue we addressed was strand length preservation. Because master strands are updated and simulated in world space, there can be a lot of stretching. We solved this by preserving the distance between each segment of the hair, going from root to tip (à la Müller).

The next big thing was to rethink the wind since the previous implementation usually clustered all the hairs together. We did this by modeling a cone around the wind direction, giving each hair a slightly different wind vector, with some random noise between frames. We also added support for custom numbers

These images show from top to bottom: edited splines (top image), master strands (image in the middle) and slave strands (bottom image), while each color represents a different wisp there.

A comparison on lodding: Top left shows LOD1, top right shows LOD2, bottom left shows LOD3 and bottom right shows LOD4.

of vertices per master strands and per slave strands. This was essential to optimize the simulation and rendering for short hairstyles.

Translucency

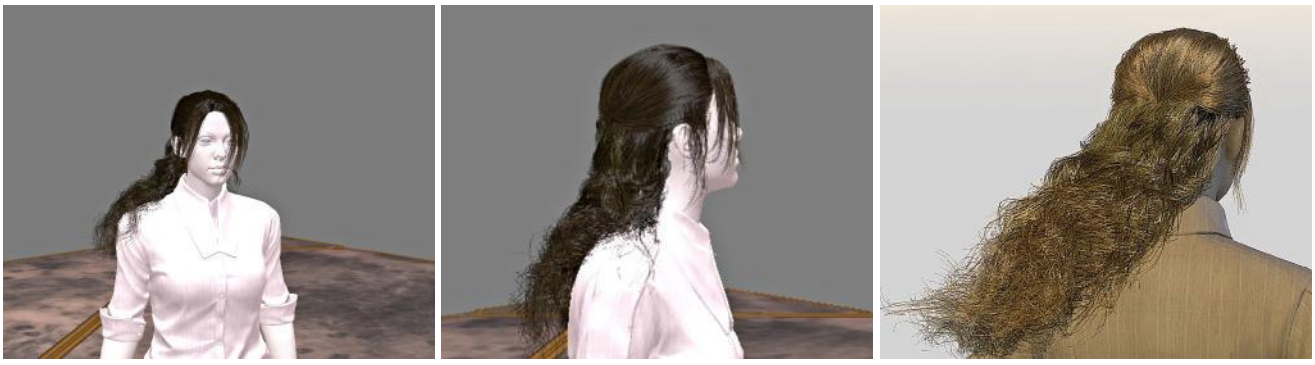
We will now discuss our investigations on different render strategies to implement OIT. It applies to both hair meshes and hair strands, since they can be mixed together, but we focus more on hair strand assets. The objective behind those investigations was to find the best compromise between quality, memory and performance. First, a few words on the importance of translucency: Research at AMD confirms that this is the most important element to get right. This is because using alpha blend is the only way to model accurately the tininess of hair strands. Without translucency, the width of any hair strand automatically becomes clamped to the pixel size. This becomes a big issue for hair strands seen afar, creating artifact and noise.

That being said, enabling translucency on hair is not a trivial task in most engines. First you need a solution to sort translucent fragments (to blend them correctly) because they cannot rely on depth testing. Then, lighting translucent primitives might involve refactoring the engine in order to reach good quality and performance. For instance, an engine might not support the same lighting features on translucent and opaque primitives. Because the character is opaque, any difference in lighting with the hair would be seen as a lighting bug. Finally, translucent hair will have issues with other depth-based techniques like motion blur, depth of field and volumetric lights. Some of which can be fixed, some of which cannot.

Opaque Render Strategy

Let's start with the opaque render strategy as a reference. In this strategy, the asset is only rendered once, using depth write. Then, there could be a resolve color pass, if the lighting was to be applied as a post-process. Like previously said, the strand size becomes clamped to the screen resolution and could appear bigger or smaller than authored. It could also look extremely noisy when then camera moves because the asset has a lot of sub pixel details.

At this point, we could improve on the opaque look by applying an anti-aliasing process to smooth the strand edges. This would remove a lot of noise at close range, but would not help at other distances. It also does not solve the pixel clamping size error (especially visible along the strands' width). An alternative solution would be to use »alpha to coverage«, using TressFX analytical alpha value, but this has been proven to be slow, mostly because »alpha to coverage« disables early depth (as suggested by engineers at AMD). Otherwise, techniques like »Weighted



Thanks to PureHair a character's hair can be simulated correctly even for collision or wind. Previously hair was clustered most of the time but Eidos Montreal solved this problem by giving each hair a slightly different wind vector. This was achieved by modeling a cone around the wind direction and by adding some random noise between frames.

This image shows an example of the opaque render strategy: In this strategy, the asset is only rendered once, using depth write. Then, there could be a resolve color pass, if the lighting was to be applied as a post-process.

Blend« did not seem appropriate in this case because of the high opacity of the hair fragments.

Opaque with Alpha Accumulation Render Strategy

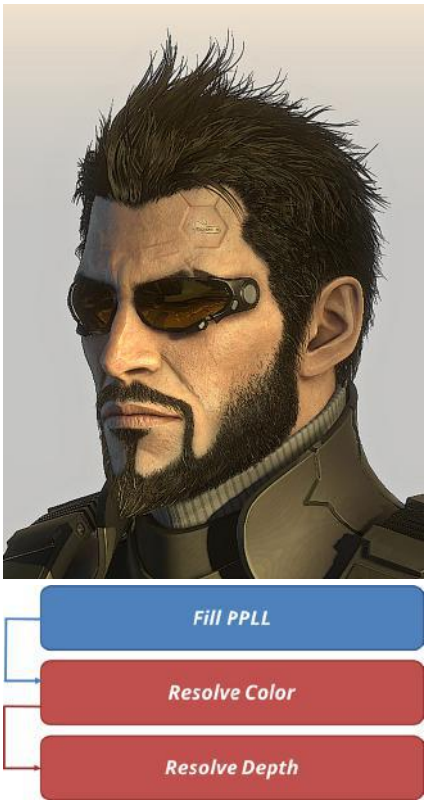
Another idea we tried was to render everything in opaque, compute the cumulative hair translucency (using an alpha accumulation buffer), and then apply the hair (color and depth) on the scene with the appropriate translucency value. This improved the silhouette significantly but the inner hairs did not get any improvements. It also took an extra render pass that could be used to get better results.

Per Pixel Linked List Render Strategy

So that brought us back to the TressFX per pixel linked list (PPLL). Quality wise, it is the best-looking solution. The render strategy is to fill the PPLL, resolve the color (sorting the PPLL entries) and then resolve the depth. Resolving the depth is a necessary evil mostly because characters use opaque materials and, again, we don't want to highlight too much that the hair are rendered with translucent materials. Without it, soft particles and other depth-based techniques would look very different on the hair (compared to the skin). It is also preferable to resolve the depth in an extra pass to allow precise control of which fragment updates the depth, based on a cumulative alpha threshold, like $A_{cum} > 25$ percent.

An important consideration when using the PPLL is the amount of space required for the

Another idea was to use the opaque render strategy and compute the cumulative hair translucency (using an alpha accumulation buffer), and then apply the hair (color and depth) on the scene with the appropriate translucency value.



The TressFX per pixel linked list (PPLL) is quality wise the best-looking solution. The render strategy is to fill the PPLL, resolve the color (sorting the PPLL entries) and then resolve the depth.

Performance comparison

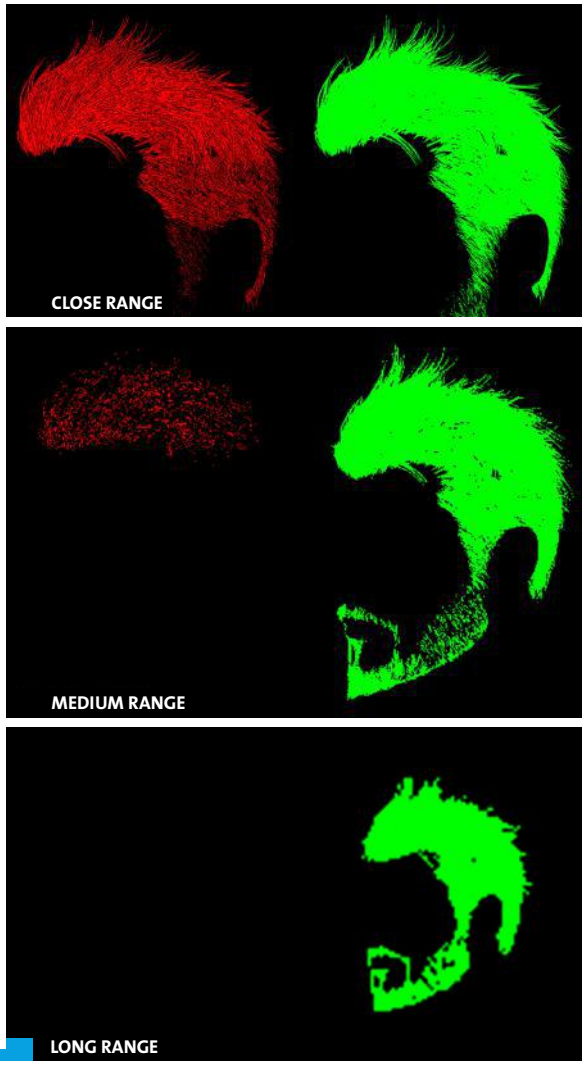
	Full Screen	Near	Far
PPLL & Depth Pre-pass	1.774	1.004	0.852
Resolve PPLL	2.059	0.422	0.146
	(3.833)	(1.426)	(0.998)
Depth Peeling	1.452	0.892	0.833
Resolve DP	1.907	0.338	0.098
	(3.359)	(1.230)	(0.931)

Performance comparison on a Radeon HD 7970, using Adam Jensen cinematic LOD (in ms)

The team found that in many cases, having a simple depth pre-pass would optimize the rendering quite significantly.

PPLL entries. In 1080p, with 12 bytes per entry and a $K_{overdraw}$ factor of 8, it takes around 200 Megabytes. This could be all right on some platforms, but an issue on others. $K_{overdraw}$ somehow relates to the maximum average overdraw when the hair takes the entire screen. If the value is too small, the filling pass could overflow the PPLL and parts of the visuals would be missing. On a performance point of view, we found that filling the PPLL was almost as fast as a simple alpha blend render pass. The PPLL overhead is mostly in the resolve color, where filled out entries need to be accessed and somehow sorted.

In PureHair, we need a lot of data per entry (16 bytes) to accurately mode the hair material. That also plays a role in the size taken by the PPLL entry buffer. We could have used less space by using forward lighting, but then deferred lighting was brought to TressFX 2.0 as a major optimization. To reduce the PPLL entry buffer size, we thought about allocating less memory, and better handling cases where it would overflow. We thought about rendering the hair in tiles, or simply in multiple passes. But in the end, we did not need to investigate those solutions (as will be discussed).



This image shows the opaque fragments at different distances: Red is the depth pre-pass and green the resolved depth.

PPLL with Depth Pre-Pass Render Strategy (also in TressFX 3.0)

One of the first things we figured out in our investigation, was that in many cases, having a simple depth pre-pass would optimize the rendering quite significantly, especially at close up distances. This is only possible for hair fragments that are fully opaque. It had also the benefit of allowing a smaller $K_{overdraw}$, like 3 instead of 8 (saving around 100 Megabytes). The idea is that all entries behind the closest opaque entry get rejected by the depth test, so that they do not need to be stored anymore and neither processed in the resolve color pass.

This would only work if the assets had mostly opaque fragments. So our guidelines for the artists became to limit the usage of translucency to only the hair strand tips and edges (the analytical value computed by TressFX). This meant no fully translucency cards and strands. In this setup, translucency essentially becomes a tool to reduce aliasing, and to smooth the hair silhouette.

Opaque Fragments at Different Distances

The depth pre-pass worked well at close range, but was useless otherwise. It actually became an overhead because of the extra geometry draw pass. We can also see that it cannot be used as a replacement for the resolve depth pass.

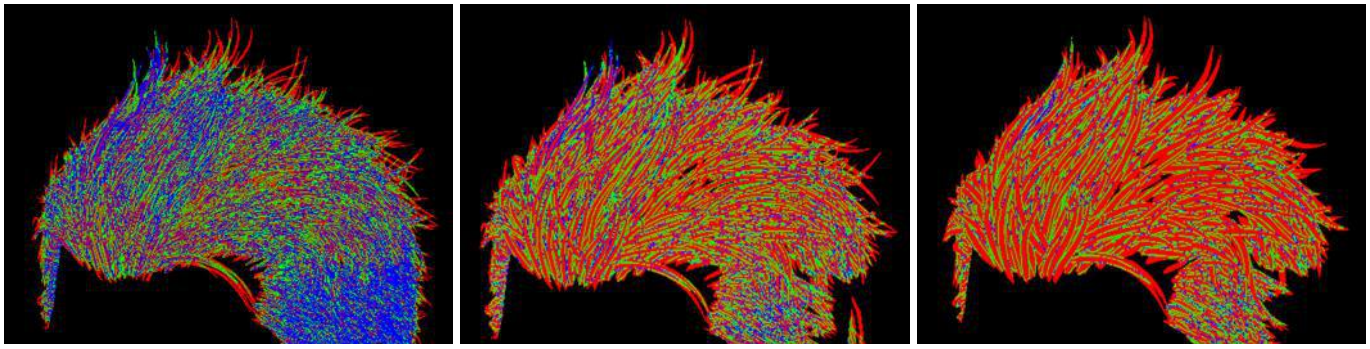
Number of Entries per Pixel for Different LODs

To fully benefit from the depth pre-pass, LODs must be used. For any distance, there is a LOD setting for which the depth pre-pass will reduce the number of entries per pixel to mostly one or two. We took advantage of this by modifying the resolve color shader so that it only processes the first two entries when computing the final color. This cannot be used for the final alpha because there are a few pixels for which the first two entries have very small opacities. Not taking the cumulative alpha into account would create significant artifacts.

At that point, we had good look and performances with our hair strand assets, but were still unhappy with the memory cost required for the PPLL. This is why we investigated a different technique, assuming the same guidelines for good performances and low overdraw.

Depth Peeling Render Strategy

We call this the depth peeling render strategy, although it is an updated implementation of traditional depth peeling, using DX11 HW features. First, we render the asset to find the two closest fragments and also to compute the cumulative opacity. The two closest depths are found using atomics on UAVs (or read-write buffers) while the cumulative opacity is computed in an off-screen buffer (like the alpha accumulation pass used with the opaque render strategy). To prevent useless process-



To fully benefit from the depth pre-pass, LODs must be used. For any distance, there is a LOD setting for which the depth pre-pass will reduce the number of entries per pixel to mostly 1 or 2 (RED : 1; GREEN : 2; BLUE : 3+).

ing, we also discard the second depth if the first depth comes from an opaque fragment.

Because the resolve color pass will only need to process the first two fragment colors, we don't need any other fragments since we already have the cumulative opacity. This is why we can immediately resolve the depth, with the subtlety of using the second fragment's depth if both depths are valid (otherwise the fill pass would fail the depth test for the second fragment). This lightens the fill pass and compensates for the somewhat heavier first pass.

The fill pass consists in looking if the fragment is one of the two closest fragments, and if so to update the appropriate entry in the depth peeling entry buffer. Note that this buffer is smaller than the equivalent buffer using the PPLL render strategy because we can use a value of 2 for $K_{overdraw}$, instead of 3, and we also don't need the PPLL first or next entry values (used to implement the linked list). In the end, this strategy requires only half of the memory cost (around 50 Megabytes). Another good thing is that there are no cases when the entry buffer could overflow, so it does not need to be handled anymore.

It also turned out to be a bit faster than the PPLL with depth pre-pass render strategy when tested on AMD hardware, but this could obviously change on different hardware or generations.

Conclusion

In conclusion, translucency on hair should be limited to tips and edges for both hair meshes and hair strands. For hair strand assets, using LODs is critical to ensure that most strands will be several pixels in width, and consequently have enough opaque fragments. Also, with opaque-ish hair, only the first two fragments are significant for the color, allowing a small $K_{overdraw}$. This allows our novel depth peeling technique, which takes half the memory budget compared to the equivalent PPLL implementation.

Uriel Doyon

The depth peeling render strategy is an updated implementation of traditional depth peeling, using DX11 HW features.

Depth Peeling Pseudo Code

```
[earlydepthstencil]
DepthPeeling()
{
        ...
        uint uDepth = asfloat(fDepth);
        If (A > .02)
        {
                uint uDepth0 = 0, uDepth1 = 0;
                Depth01UAV.InterlockedMin(uAddress, uDepth, uDepth0);

                // If the fragment is opaque, try to discard the 2nd entry.
                uDepth = alpha > .98f ? uDepth : max(uDepth, uDepth0);

                Depths01UAV.InterlockedMin(uAddress + 4, uDepth, uDepth1);
        }
        return 1- A; // Blend mode: multiply
}

ResolveDepth() : Depth
{
        ...
        return Acum >= 0.75 ? (uDepth1 != MAX_FLOAT ? uDepth1 : uDepth0) . MAX_FLOAT;
}

[earlydepthstencil]
FillNode ()
{
        ...
        uint uDPIndex = (uDepth == uDepth0) ? 0 : ((uDepth == uDepth1) ? 1: 0xFF);
        if (uDPIndex <= 1 && A > .02)
        {
                StoreFragment(uAddress + uDPIndex, ...);
        }
}
```

A source code example for the depth peeling render strategy.

ETHIK ALS SPIELMECHANIK
WER SPIELT DA EIGENTLICH?

Wie passen Ethik und Game Design zusammen? In diesem ersten Teil einer Artikelreihe erklärt Wolfgang Walk, wie Spieler ethische und soziale Aspekte in Spielen überhaupt aufnehmen.

Wolfgang Walk
ist Mitgründer
von Grumpy Old Men.

Wolfgang Walk macht seit 1991 Games. Seit Blue Byte ihn 1995 als Producer und Autor einstellte, kann er davon leben. 2001 bis 2005 arbeitete er als Producer bei Massive Development, bevor er als selbstständiger Producer, Autor, Regisseur und Designer Kunden in halb Europa betreute. Seit 2006 lehrt er in diesen Bereichen an verschiedenen Hochschulen in ganz Deutschland.
2014 gründete er zusammen mit Michael Hengst die »Grumpy Old Men«, die sich auf die Beratung von jungen Start-ups in der Games-Industrie in den Feldern Business, Organisation, Game Design und Story Design spezialisiert haben.
In seinem Blog »Der Blindband« (https://thevirtualmirror.files.wordpress.com) lässt er sich mehr oder weniger regelmäßig zu Themen rund ums Computerspiel und seine Industrie aus.

Im Herbst 2014 wurde ich von der Mediadesign Hochschule (MD.H) in München eingeladen, eine Vorlesung zum Thema »Ethische und soziale Aspekte« abzuhalten. Ich weiß bis heute zwar nicht, ob ich das Thema so interpretiert habe, wie die MD.H sich das vorgestellt hat, aber zumindest habe ich die Gelegenheit genutzt, mich einmal auf halbwegs wissenschaftlichem Fundament mit einer Reihe von Fragen zu beschäftigen:

- Wie gerät Ethik eigentlich in ein Game hinein?
- Was hat sie da verloren?
- Und wenn man sie möglicherweise nicht vermeiden kann – kann man sie sich vielleicht sogar zunutze machen?

Um es direkt zu sagen: Die Antworten, die ich fand, haben meinen Blick auf Game Design – und hier speziell auf das Design der Story innerhalb eines Games – massiv erweitert und teilweise fundamental verändert. Ich will sie im Folgenden erläutern.

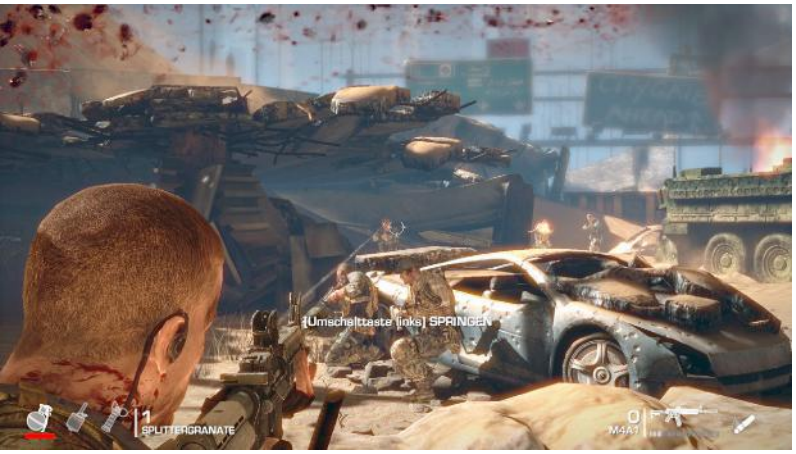
Der zugrunde liegende wissenschaftliche Diskurs ist nicht einfach und greift unter anderem tief in die Werkzeugkisten von Psychologie und Hermeneutik. Ich werde versuchen, ihn so weit nachzuvollziehen, wie es zum Verständnis des Themas notwendig ist – und dabei so flach zu halten, dass möglichst viele Menschen zu Ende lesen können, ohne eine schwere Hirnmuskelzerrung davonzutragen. Psychologen und Philosophen mögen sich dann wegen unzulässiger Vereinfachungen die Haare raufen, doch mir geht es um Wichtigeres, nämlich um bessere Games. Und die bedeuten eine bessere Welt. Fragt nach bei Schiller.

Meine stark verknappte Hauptthese ist: Spiele sind wie keine andere Kunstform dazu prädestiniert, als ethisches Fitnesszentrum zu wirken; und wenn sie diese Chance nutzen, werden sie in der Regel sogar bessere Games – herausfordernder, interessanter, kurz: spaßiger.

Dabei gilt es, von vornherein ein paar Missverständnisse auszuräumen sowie einige Axiome einzurammen:

- Ein ethisches Spiel ist meistens nicht das Spiel, das uns eine vorgegebene Dichotomie von Gut und Böse nachspielen lässt und uns dabei schlimmstenfalls sogar die Beurteilung verwehrt, was jetzt genau gut und was böse ist. Ein ethisches Game Design nimmt den Spieler als Wesen mit einer bereits altersgemäß entwickelten Ethik ernst und überlässt ihm die Entscheidung.
- Ein ethisches Spiel ist deshalb auch in keinem Fall das Spiel, das seine Spieler als Moralsäuglinge behandelt. Es stellt den Spieler vor ethische Herausforderungen, genauso wie es ihn

»This War of Mine« ist ein Kriegsspiel, in dem der Spieler allerdings nicht wie üblich den strahlenden Helden mimt, sondern vielmehr als Zivilist das Grauen er- und überleben muss.



»Spec Ops: The Line« von Yager Development aus dem Jahr 2012 versetzt den Spieler in der Haut eines Soldaten in einen Wüstenstaat, wo moralische Entscheidungen nicht immer als Schwarz oder Weiß zu erkennen sind.

vor motorische, exploratorische, strategische oder logische Herausforderungen stellt.
- Die rein abstrakte Spielmechanik kann keine Ethik erzeugen. Ethische Herausforderungen entstehen erst durch ihre Abbildung in der Spielwelt (und hier insbesondere durch Story) – und durch die mediale Auseinandersetzung des Spielers mit derselben.
- Umgekehrt jedoch kann durch eine ethische Herausforderung Spielmechanik erzeugt werden. Diese ist dann aber nie abstrakt, sondern entsteht aus dem Konflikt im Kopf des Spielers als ganz konkrete Herausforderung in der Spielwelt.

Wir reden also beim Thema Ethik in Games nicht von erhobenen Zeigefingern, sondern von einer zusätzlichen Möglichkeit, den Spieler vor interessante Herausforderungen zu stellen. Dies streift natürlich auch die Gewaltdiskussion um Computerspiele, die erst jüngst um den aparten Vorwurf bereichert wurde, First Person Shooter seien für den modernen Terrorismus zumindest mitverantwortlich. Die wissenschaftliche Betrachtung allerdings tritt den selbst ernannten Moralaposteln in Presse, Funk und Fernsehen deftig von hinten in die Kniekehlen:

Es ist allgemein akzeptiert, dass den Fähigkeiten der Spieler angepasste Herausforderungen des Computerspiels die entsprechenden Fähigkeiten der Spieler fördern. Man fand beispielsweise heraus, dass Menschen, die viel spielen, schneller bessere Chirurgen werden.[1] Nur wenn der Spieler vor ethische Herausforderungen gestellt wird, geht ein Teil der Öffentlichkeit nach wie vor von allgemeiner Wehr- und Schutzlosigkeit aus, obwohl die These, dass es sich bei Spielern um moralische »Zombies«[6] handelt, durch zahlreiche Studien[2,3,4] als extrem zweifelhaft bis offenkundig widerlegt gelten kann. Spieler zeigen maximal sehr kurzfristig gesteigerte Aggressionen und – abhängig vom Spielziel – zum Teil sogar eine Verringerung des aggressiven Potenzials. Dafür gibt es Gründe, die weiter unten klarer werden.

Deshalb hier noch einmal ganz deutlich: Ethische Herausforderungen im Game Design schulen die Ethik des Spielers, zumindest solange diese Herausforderungen keine Überforderung darstellen, wie es wahrscheinlich der Fall ist, wenn ein Spiel wie »GTA 5« von einem Achtjährigen gespielt wird.

Es wäre natürlich Unfug, jetzt so zu tun, als wäre das Konzept ethischer Herausforderung in Spielen völlig neu. Es gibt solche Mechaniken schon lange, und die Ergebnisse werden in der Regel auch von der Öffentlichkeit mit Wohlwollen verfolgt. Sei es »Spec Ops: The Line«, »This War of Mine«, »Papers, Please!«, »GTA« oder bereits viel früher »Bioshock«, um nur einige der populärsten Exemplare zu nennen. Jeder hat schon Spiele gespielt, in denen er vor ethische Dilemmata gestellt wurde. Dilemmata, die man nicht befriedigend auflösen konnte (sonst wären es keine Dilemmata), die man aushalten musste; oder die einen sogar dazu gebracht haben, mit dem Spiel aufzuhören. Ich werde versuchen darzulegen, warum diese Spiele dadurch nicht unethisch werden – und warum sie vielleicht gerade deshalb herausragende Games sind.

Als Erstes wäre aber natürlich mal eine Frage zu klären:

Was ist das eigentlich, Ethik – und was hat sie in Games verloren?

Die Ethik, weiß die Wikipedia, »ist jener Teilbereich der Philosophie, der sich mit den Voraussetzungen und Kriterien rationalen menschlichen Handelns befasst. Im Zentrum der Ethik steht das spezifisch moralische Handeln, insbesondere hinsichtlich seiner Begründbarkeit und Reflexion.«[5]

Wenn wir also von Ethik im Spiel reden, ist sofort klar, dass die Ethik der Spielwelt nicht in unserer realen Welt begründbar sein muss. Sie muss in der virtuellen Gegenwelt, die wir als Designer konstruieren, rational sein und dort moralisches Handeln begründen, nicht in unserer Welt.

Und weil es eine Gegenwelt ist, kann moralisches Handeln in dieser Welt naturgemäß ganz anders aussehen als in unserer. Genau so, wie

Die Reihe im Überblick

Dies ist der erste Teil einer kleinen Artikelreihe über die Frage, wie man sich Ethik als Spielmechanismus verfügbar machen kann. Sie erschien zuerst in Wolfgang Walks Blog »Der Blindband« und wurde für die vorliegende Veröffentlichung überarbeitet und aktualisiert. Teil zwei und drei werden in den nachfolgenden Ausgaben erscheinen.

- **Teil 1**
  Wer spielt da eigentlich?
- **Teil 2**
  Ethik und Moral als Konfliktparteien
- **Teil 3**
  Die normative Kraft des Ethischen

in Spielen gelegentlich die Gesetze der Physik anders verlaufen als in unserer Welt (Lichtschwerter? Im Ernst?), können auch die Gesetze menschlichen Zusammenlebens anders lauten. Sie werden dadurch nicht unethisch. Ganz im Gegenteil kann man sogar sagen, dass die vollständige, kritiklose Übernahme diesweltlicher Ethik in eine Gegenwelt unethisches Game Design hervorbringen kann, weil im Laufe des Design-Prozesses zumindest geprüft werden muss, ob diesweltliche rationale Gründe in der Gegenwelt nicht irrational werden.

Als Game Designer sind wir es gewohnt, Mode, Gebrauchsgegenstände, Waffen, Technologie, Flora und Fauna sowie das Interface und Dutzende andere Dinge den gegenweltlichen Gegebenheiten anzupassen. Es gibt keinen einzigen guten Grund, das Gleiche ausgerechnet mit den Grundregeln nicht zu tun, nach denen dort Gesellschaft funktioniert. Zumindest dann nicht, wenn wir handelnde Charaktere haben (»Tetris« hat keine Ethik, weil es seine Spielmechanik beinahe vollständig abstrakt hält und so gut wie nicht narrativiert). Denn was soll die Handlungen der Charaktere begründen, wenn nicht ihre eigene, ja meist fehlerhafte Ethik? (Die Ethik jedes Einzelnen ist fehlerhaft durch irrationale Brüche, die aus dem Es des Charakters entspringen. Sogar wenn er ein Gott ist. Vor allem wenn er ein Gott ist!)

Was soll eine Handlung begründen, eine Story, wenn nicht die jeder Ethik innewohnenden Konflikte zwischen Es, Ich und Über-Ich, zwischen Eigen- und Gesellschaftsinteresse, zwischen Ratio und Religio? Und was soll für den Spieler eine ethische Herausforderung begründen, wenn nicht der Konflikt zwischen diesweltlicher und gegenweltlicher Ethik?

Es ist bei der Betrachtung dieser Fragen aber auch notwendig, ein bisschen besser zu verstehen, wie die Beziehung zwischen Spieler und Computerspiel überhaupt aussieht. Wie entsteht sie? Was unterscheidet diese Beziehung möglicherweise von unserer Beziehung zur wirklichen Welt? Warum können wir uns auf ethische Systeme in Gegenwelten einlassen, die unseren teilweise diametral entgegenstehen, ohne von diesen Konflikten traumatisiert zu werden? Die Antwort ist überraschend einfach:

Nicht alle Spieler empfinden Gewalt in Games gleich. Die Folterszene in »GTA 5« zum Beispiel wurde vielerorts kontrovers diskutiert – manche Spieler beendeten das Rockstar-Meisterwerk hier, andere störten sich nicht daran.

Der Spieler ist nicht der Spieler!

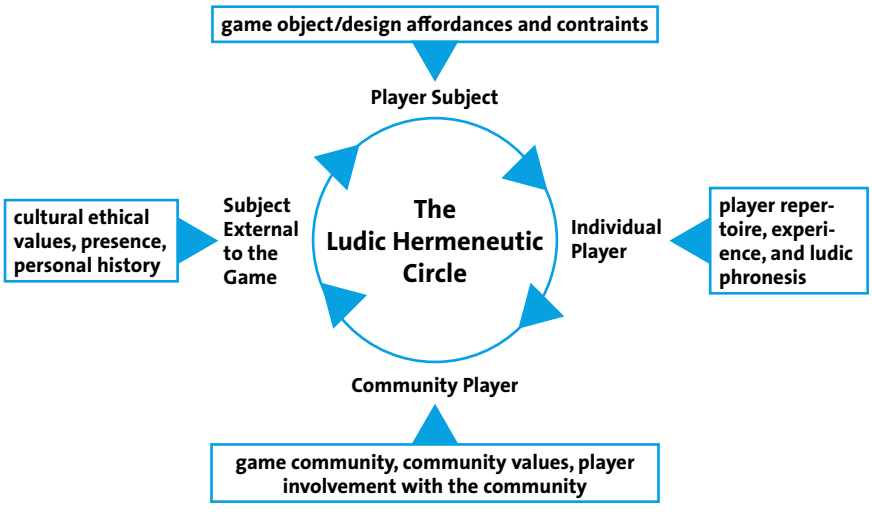
Der Mensch tritt nicht mit Leib und Seele in die Gegenwelt eines Computerspiels ein. Zumindest der Leib bleibt im Hier und Jetzt. Und auch ein Teil der Synapsen des Gehirns ist nach wie vor mit diesweltlichen Problemen beschäftigt: Diverse Körperfunktionen müssen gesteuert werden, Gehör und andere Sensoriken sind zumindest teilweise noch aktiv und auf die Wirklichkeit gerichtet. Was dem Spiel gegenübertritt, ist also etwas anderes als der Spieler selbst. Es ist eine Teilmenge von uns. Und es ist eine Teilmenge, die ihrer eigenen Agenda folgt.

In Miguel Sicarts hochinteressanter, wenn auch nicht immer 100 Prozent folgerichtiger Arbeit »The Ethics of Computer Games« wird diese Teilmenge des Spielers das »player subject» genannt: »Becoming a player is the act of creating a balance between fidelity to the game situation and the fact that the player as subject is only a subset of a cultural and moral being who voluntarily plays, bringing to the game a presence of culture and values that also affect the experience.«[6]

Für uns als Game Designer ist es wichtig zu beachten, dass sowohl der kulturelle Hintergrund als auch die moralischen Bewertungen der einzelnen Spieler so unterschiedlich voneinander sein können, wie es die Spieler in einem globalen Markt sind. Wo der eine Spieler kein Problem hat, in »GTA 5« einen NPC zu foltern, schaltet der andere das Spiel an dieser Stelle aus.

Ludisch hermeneutischer Zirkel

Diese Grafik entstammt dem Buch »The Ethics of Computer Games« von Miguel Sicart, das im Verlag MIT Press erschienen ist und unter folgendem Link bestellt werden kann:
www.makinggames.biz/sicart


game object/design affordances and contraints
Player Subject
cultural ethical values, presence, personal history
Subject External to the Game
The Ludic Hermeneutic Circle
Individual Player
player repertoire, experience, and ludic phronesis
Community Player
game community, community values, player involvement with the community

Not every game is for every player. Dies macht weder einen der beiden Spieler zum besseren Menschen noch »GTA 5« unethisch. Als Game Designer haben wir aber ein natürliches Interesse daran, den Spieler bei der Stange zu halten (es gibt Ausnahmen, auf die ich in den späteren Teilen noch eingehen werde). Der Umstand sollte uns als Designern also bewusst sein.

Für das Thema ist dieser Umstand aber noch aus anderen Gründen interessant: In dem Moment, in dem der Spieler aufhört zu spielen, hört auch dieses Spielersubjekt auf zu existieren. Das Wesen, das in einer Gegenwelt möglicherweise Taten verübt hat, die ihm in dieser Welt sofort Sicherheitsverwahrung einbrächten, verblasst in wenigen Minuten vollständig. Und eventuelle Effekte auf das Aggressionspotenzial des Spielers, egal in welcher Richtung, verblassen mit ihm. Was bleibt, ist die Erinnerung an dieses Wesen im Spieler. Und für den Fall, dass die ethischen Konflikte wirklich aufwühlend waren (und der Spieler reif genug ist, ihnen zu begegnen), auch eine gedankliche Auseinandersetzung mit den Handlungen des »player subjects«. Aus Affekt wird Reflexion: ein ethischer Trainingseffekt.

Und (dies – großes Ehrenwort – ist der letzte Exkurs in die Gewaltdiskussion) nur schwer kranke Menschen werden in der Reflexion zu dem Schluss kommen, dass es auch in dieser Welt in Ordnung ist, mit einer Knarre durch die Gegend zu laufen und wahllos Menschen zu erschießen. Zu dieser Erkenntnis benötigen sie aber kein Computerspiel, wie der Umstand zeigt, dass es Amokläufe auch schon vor der Erfindung des First Person Shooters gab.

Die wichtigste Erkenntnis für uns als Game Designer jedoch ist: Der eigentliche ethische Konflikt entsteht im »player subject«, das verschieden vom Spieler ist. Ethische Herausforderungen im Spiel sind also gegenüber dem Spieler instanziiert, werden in Stellvertretung erlebt und durchlitten – und das erlaubt uns, ein wenig an der Zumutbarkeitsschraube zu drehen.

Der ludische hermeneutische Zirkel

Es gehören noch andere Elemente zu dieser Reflexion: Die Community des Spiels, die aus Presse, Foren, Freundeskreis und jeder Form der öffentlichen Rezeption eines Spiels besteht, nimmt zu Recht einen nicht unbedeutenden Teil in der Definition des ludischen hermeneutischen Zirkels bei Sicart ein.[6]

Dieser Zirkel, der beschreibt, wie ein Spiel rezipiert und verarbeitet wird, ist in Wahrheit natürlich eine Spirale, weil die Rezeption eines Spiels nicht endet, nachdem man es einmal reflektiert hat. Das Erkennen des Spiels hat sich lediglich auf eine höhere Ebene verlagert.

Interessant ist dabei der von Sicart verwendete Begriff der »ludic phronesis«. Phronese (Es existiert auf Wikipedia noch kein deutscher Artikel dazu. Wer sich berufen fühlt, darf dies gern als Aufforderung begreifen ...) ist ein Begriff aus der aristotelischen Ethik und meint die praktische Weisheit, den gesunden, aus der Erfahrung heraus geborenen Menschenverstand.

Dieser ist natürlich ein anderer, wenn er (für das »player subject«) aus Spielregeln erwächst, als wenn er sich im Dieswelt lichen bildet, für das ja ganz andere Regeln gelten. Entsprechend unterscheidet sich die ludische dann natürlich auch von der dieswelt lichen Phronese. Sprich: Was in der Spielwelt vollkommen logisch, vernünftig und ethisch korrekt sein kann, muss dies in unserer Welt nicht sein.

Dennoch ist im Spieler aber natürlich immer die alltägliche Phronese vorhanden, und sie lässt sich auch nicht vollkommen ausschalten. Sobald die ludische Phronese also mit unserer alltäglichen in Konflikt gerät, finden wir eine Situation vor, die uns herausfordert. Einen innerhalb der Spielwelt moralisch integren Menschen wird diese Herausforderung außerdem interessieren. Nicht verwechseln: Man kann innerhalb der Spielwelt moralisch nicht integer sein – aber im Dieswelt lichen der integerste Mensch der Welt – und umgekehrt. Das Resultat ist folglich eine interessante Herausforderung – und genau das ist es, was wir als Game Designer (ich betrachte Story Designer, denn die betrifft diese Erkenntnis in erster Linie, hier als spezialisierte Game Designer) erschaffen wollen.

Aus der Ménage-à-trois zwischen Spieler, Spielersubjekt und Spiel können somit Herausforderungen entstehen, die wir als Game Designer nutzen können, um das Spielerlebnis interessanter zu gestalten. In der Art, wie diese Dinge zu konstruieren sind, unterscheiden sie sich massiv von den uns vertrauten Spielmechaniken Logik, Strategie und Motorik. Im Ergebnis können sie aber genauso wirkungsvoll sein.

Der nächste Teil dieser Serie wird sich daran versuchen zu erläutern, wie man vom Erkennen des Potenzials, das Ethik als Game-Design-Ziel hat, zu konkreten Design-Parametern kommt, an denen man spielerisch gutes ethisches Game Design erkennt.

Wolfgang Walk

»Papers, Please!« macht unethische Entscheidungen zur Spielmechanik. Als Grenzbeamter eines totalitären Staats muss der Spieler entscheiden, wer einreisen darf und wer nicht - in aller unbarmherzigen Konsequenz.

Quellenangaben und weiterführende Links

Der Artikel verweist auf einige Studien und andere Quellen. Diese sind unter **www.makinggames.biz/ethics** zusammengefasst und beinhalten:

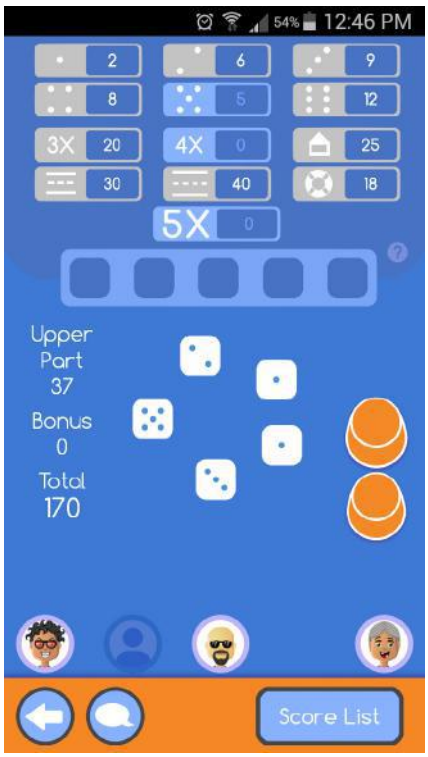
1. »The impact of video games on training surgeons in the 21st century«, by Rosser JC. Jr, Lynch PJ., Cuddihy L., Gentile DA., Klonsky J., Merrell R.
2. »Long-term US study finds no links between violent video games and youth violence«, by James Vincent
3. »Violent Video Games Don't Lead to Increases In Violent Crimes, Study Finds«, by Eddie Makuch
4. »Virtually justifiable homicide: The effects of prosocial contexts on the link between violent video games, aggression, and prosocial and hostile cognition«, by Seth A. Gitter, Patrick J. Ewell, Rosanna E. Guadagno, Tyler F. Stillman and Roy F. Baumeister
5. Wikipedia: Definition Ethik
6. »The Ethics of Computer Games«, by Miguel Sicart

IMPLEMENTING NFC IN A GAME

b-interaktive created a mobile version of the classic game Yahtzee. To set their game apart from competitors and to improve gameplay with nearby friends the team decided to implement NFC functionality.

Bronislaw Tomaszewski is Senior Software Developer at b-interaktive.

Bronislaw Tomaszewski is a part of the mobile gamedev industry since 2006. He started his carrier at Hands-On Mobile and later continued it in Twistbox Games where he was working on major titles from Taito, Square Enix, Konami, EA, Take-Two across all J2ME mobile phones. He is a part of the b-interaktive team since the very beginning, working on multiplayer Android and iOS games.



»Yahtzee« games are similar to poker. Each player rolls a set of five dice and decides which should be kept and which re-rolled to get a better combination (e.g. three of a kind, full house or straight).

From the very start our company had one main purpose – to become synonymous with the word »innovation«. We know very well that being innovative is all about learning. After four years of b-interaktive's presence on the market we have sure learned a lot; but it doesn't mean that we are done expanding our knowledge. Embracing new technologies instead of shying away from them, we have decided to look for a new solution that would improve our applications. This is when we set our eyes on the NFC technology. At their cores, our products combine innovation and intuitiveness and the NFC technology allowed us to make this mixture even better.

The Near Field Communication (NFC) is a technology that allows devices such as smartphones and tablets to exchange data through radio communication. This exchange of information can be triggered by proximity or direct contact between said devices. In the 21st century two people tapping their smartphones together can easily be perceived as a normal social interaction; it can carry a certain emotional load or even symbolize intimacy. We are always encouraging our users to establish an emotional contact between each other and with the NFC we can finally step beyond the boundary of the virtual world and enter the physical one.

Kniffel LIVE/Dice Duel

Right now, our most popular new product in Germany (over 10,000 daily active users!) is »Kniffel LIVE«, licensed by Schmidt Spiele, which is available on Google Play and Windows Phone since January, 2015 and was released on the Apple App Store at the end of June, 2015. »Kniffel« (internationally known as »Dice Duel« or »Yahtzee«) is a multiplayer version of a classic dice game that can be played either with friends (via Facebook or other social media platform) or random opponents from all over the world. Improving and polishing being a part of our daily work plan, we decided to use this app to explore the NFC technology and at the same time provide our users with an innovative new feature.

»Kniffel LIVE/Dice Duel« is a quick, simple and fun game so the NFC technology fits it perfectly. It felt almost natural to improve the matchmaking and simplify setting up a game by allowing our users to do it via the NFC. To cut the long story short, our goal was to allow two users to start a new match by just tapping two devices together and pressing the screen.

Before explaining how the NFC function was implemented, we should first make clear why we decided to choose this technology and how it fits this particular game.

»Kniffel LIVE« started out as a single player game. We always felt that out of all our licensed and original ideas this one is the most universal when it comes to audience. Be it a blessing or a challenge (probably both), there was no room for mistakes there; we had to nail it. The demand was there and the competition was already fulfilling it. But while they were experimenting with in-app purchases, visuals and game modes, we focused on gathering experience. It took us two games to perfect and hone our solutions, not only in terms of flow but also gameplay and backend. In the meantime, we went through quite a few design concepts finally ending up with two gameplay types: asymmetric (will be introduced soon!) and classic, turn-based. In-app purchases were limited to cosmetic features (like customized avatars) and we focused on providing our users with the most fair, elegant and simple to understand gameplay experience.

It's probably clear at this point that design simplicity is very important in our games. »Kniffel LIVE« is an extreme case – being a product with such a broad target audience, we had to make sure that everyone, both very young and old, will be able to understand and navigate through the application with ease. Compared to slightly cluttered designs of the competition,

»Kniffel LIVE« might look like it's lacking in features. Nothing could be further from the truth. Instead of bombarding the user with functions, options and in-app purchases, we have chosen to guide him or her through the game, revealing all the important features one after another and hiding those aimed at the more hardcore players (who will, no doubt, enjoy discovering them on their own). This guided experience accomplished more than one goal. First of all, it didn't burden a new user with (at this point) irrelevant information. Secondly, it allowed us to design a stylish and elegant user interface that stands in direct opposition to the sometimes very gaudy and flashy graphic styles chosen by the competition. Last but not least, the player is always no more than three »taps« away from playing; because, after all, this is why he or she downloaded our product.

And this is where the NFC technology comes in – a direct extension and natural evolution of the simplicity, elegance and freshness of »Kniffel LIVE«.

Implementing the NFC

To make the interface of a game simple and intuitive, the player has to be guided by the application. Allowing for unwanted and sometimes accidental NFC game challenges that would disrupt the flow, gameplay and, in consequence, the user's experience was out of the question. To make the flow of the game smooth and user experience positive, we decided to enable the NFC feature only on devices running Jelly Bean OS or higher. The reason for that was quite simple: Jelly Bean is the first OS that allows for checking the state of the NFC and Android Beam. Keeping in mind that nothing is more frustrating than a new feature that cannot be used, we agreed that it would be better not to display the NFC mode on devices running on an OS older than Jelly Bean. Two checks are performed upon the launch of the game:

1. First we are checking the OS version of the device. If it's older than Jelly Bean, we are not displaying the NFC mode (»Tap and Play«).

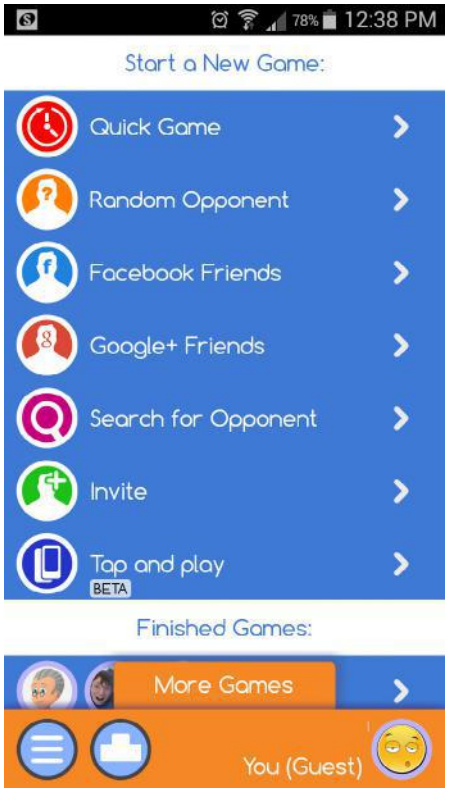
```
private boolean isNfcRequiredApiPresent()
    {
        return android.os.Build.VERSION.SDK_INT >=
android.os.Build.VERSION_CODES.JELLY_BEAN;
    }
```

2. Secondly, we must make sure that the user's device is NFC compatible. Again, if not, we're not showing the NFC mode on the Game List screen. Additionally, as soon as we confirm that the device is NFC compatible, we are creating a Push Message for the later use.

78% 12:39 PM
Tap and play
Tap two devices together
to start a game.
'NFC' and 'Android Beam' functions
must be enabled on both devices.

To start a game via NFC, players must tap their phones together. The duel will begin immediately.

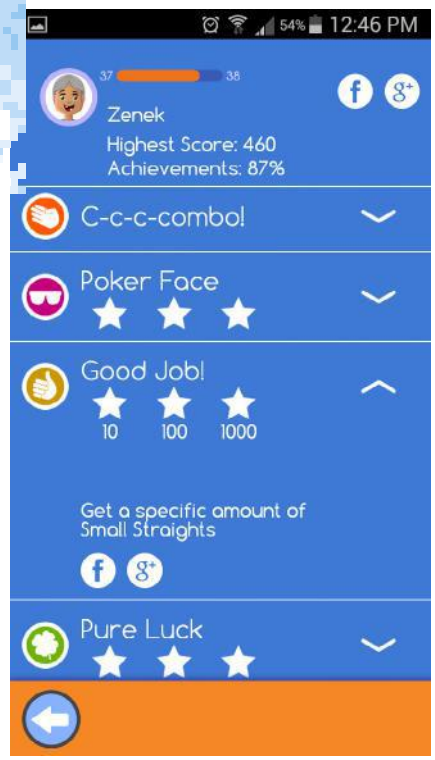
```
private void initNFC()
    {
        mNfcAdapter = NfcAdapter.getDefaultAdapter(this);
        if (mNfcAdapter != null)
        {
            mNfcAdapter.setNdefPushMessageCallback(new CreateNdefMessageCallback() {

                @Override
                public NdefMessage createNdefMessage(NfcEvent event)
                {
                    if (isTapAndPlayScreenVisible())
                    {
                        String text = Long.toString(player.getAzureOwner().getId());
                        NdefMessage msg = new NdefMessage(new NdefRecord[] { createMimeRecord("application/
com.binteraktive.kniffel.live", text.getBytes())
                                                                                , NdefRecord.
createApplicationRecord("com.binteraktive.kniffel.live") });
                        return msg;
                    }
                    else
                    {
                        return null;
                    }
                }
            }, this);
        }
    }
public boolean isNfcAvailable()
    {
        return mNfcAdapter != null;
    }
```



The »Tap and Play« (NFC) mode is currently in beta and at the moment available on Android devices only.

If the check turns out positive, we are displaying a new mode in the »New Game« section of the Game List Screen: »Tap and Play«. Pressing it will activate the NFC communication and make the beaming of data possible. At this point, we have to perform two more checks:

1. We are starting with making sure that the NFC is turned on. If not, we are redirecting the user to Settings.



»Kniffel Live/Dice Duell« offers a lot of social interaction. Players can invite their friends from Facebook and play against each other. They can also share highscores and achievements.

```
public boolean isNfcEnabled()
    {
        return mNfcAdapter.isEnabled();

    }
```

2. Since we are using the Android Beam to transfer data, we have to make sure that it's active, too. In case it's not, the user will be asked to turn it on before proceeding.

```
public boolean isNfcBeamEnabled()
    {
        return mNfcAdapter.isNdefPushEnabled();

    }
```

The user is guided through the process by a graphic visualization of the actions that need to be taken to successfully start a new game. Though extremely simple on the user's side (he or she just needs to tap two devices together!), the process is a little bit more complex on ours. When »pairing« two devices we also have to check whether the NFC and Android Beam are set to »ON« on both of them. Afterwards, both devices are sending their ID's to each other through the Push Message created earlier. At this point, the Push Message has to be received and interpreted:

```
@Override
    protected void onNewIntent(Intent intent)
    {
        super.onNewIntent(intent);

        if (NfcAdapter.ACTION_NDEF_DISCOVERED.equals(intent.getAction()) && isTapAndPlayScreenVisible())
        {
            Parcelable[] rawMsgs = intent.getParcelableArrayExtra(NfcAdapter.EXTRA_NDEF_MESSAGES);

            NdefMessage msg = (NdefMessage) rawMsgs[0];

            String beamSenderId = new String(msg.getRecords()[0].getPayload());

            createGameWithNfcUser(beamSenderId);

        }
    }
```

b-interaktive improves classic games with innovative features. They constantly experiment and discuss new ideas.

Finally, the game is created with both ID's as participants and users automatically join it.

Google proposes to keep the NFC functionality always »active«. While we are ok with keeping it in the always »active« state when the game is in the background, for the sake of controlled experience we had to limit it during user's interaction with our product. That is why the receiver device undergoes one final check – whether it's currently on the correct screen, or, in simple words, whether both users pressed the »Tap and Play« button.

When the application is in the background the process looks a little different. In this case, the game can automatically intercept the Push Message sent by another user through NFC and open the application immediately afterwards at the same time creating a game with that user.

```
@Override
    public void onResume()
    {
        super.onResume();
        Intent intent = getIntent();
        if (NfcAdapter.ACTION_NDEF_DISCOVERED.
equals(intent.getAction()))
        {
            Parcelable[] rawMsgs = intent.getParcelableAr
rayExtra(NfcAdapter.EXTRA_NDEF_MESSAGES);

            NdefMessage msg = (NdefMessage)
rawMsgs[0];

            String beamSenderId = new String(msg.
getRecords()[0].getPayload());

            createGameWithNfcUser(beamSenderId);
        }

    }
```

Lessons learned

The NFC technology feels natural in »Kniffel LIVE/Dice Duel«. Accidently, it also turned out to be quite simple to implement. Keeping in mind the purpose of our application and always focusing on the user's experience, we are able to implement the solution proposed by Google and minimize the modifications. Innovation doesn't necessarily have to be complex but it should always be a learning process. Thanks to that we are able to keep up with the cutting edge technology and accomplish the goal of our company. We learned that not every device equipped with the NFC technology can be treated the same; that this feature is strongly dependent on the OS being used. Additionally, we confirmed that the player's experience is the most important aspect of the game and it should always be put first, even if it means that the feature or technology used must be somehow limited. With the knowledge gained from implementing the NFC technology in »Kniffel LIVE/Dice Duel« we are looking for new ways of improving our existing products. And, who knows, maybe we'll create a brand new one based solely on the NFC features?

Bronisław Tomaszewski

PAPER PLANES INFLUENCE REAL LIFE

KLM Royal Dutch Airlines explain how their mission-based endless flyer Jets can get passengers to arrive at their gate on time and therefore prevent delays.

KLM Royal Dutch Airlines is the oldest airline in the world that still operates under the original name. Last year, it celebrated its 95th birthday. However, being old does not mean being old-fashioned and KLM is on the forefront of the new media era and we like to explore new things to reach our community, such as games. This resulted in the launch of »Aviation Empire« in 2013 and more recently, the release of »Jets«. Jets is a mission-based endless flyer for mobile devices, in which players lead their paper plane through an obstacle-ridden cardboard world. They can do this in a single player mode, but the game also offers a turn-based multiplayer mode in which players use their social media account.

Social by Design

Having a social feature is logical, since KLM is very active on social media and we have a huge following on Facebook and Twitter. Tapping into this fan-base feels natural and is in line with our strategy of being where the customers are. Via social media, KLM can reach new target audiences and turn them into KLM ambassadors and future customers. For us, a game needs to be social by design. This goes beyond just using a social login for your game. In Jets, players can challenge their friends through social media and post a message to their wall if they win. Sharing relevant messages on social media has a strong ripple effect. By using different facets of social media, Jets will be much more visible and by having a presence in games, KLM can introduce its brand to (casual) gamers in a way that they can relate to. Having hundreds of thousands of play sessions in both »Aviation Empire« and Jets is more powerful than an ad campaign.

Larger Audience

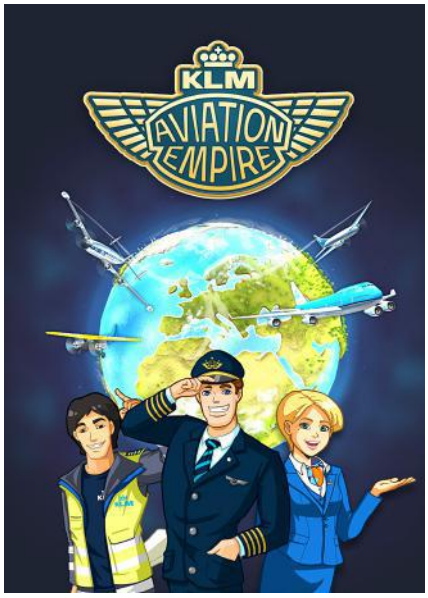
Compared to »Aviation Empire« – a 3D strategy game in which players run their own airline – Jets is very casual. This was not a random choice. »Aviation Empire« was successful – it was downloaded more than 950,000 times and received great reviews from both press and players. However, a single play session can easily reach fifteen minutes or more, and strategy games are also considered a bit of a niche. For the second game, we were looking for something more casual and with shorter play sessions to be able to reach a

Karlijn Vogel-Meijer
is Social Media Manager at KLM.

Karlijn Vogel-Meijer has worked for KLM for many years. After various functions in the operational divisions of KLM, she is currently working as manager social media. She is responsible for creating a social media strategy worldwide in cooperation with Marketing and Corporate Communications. KLM strives towards an integrated approach regarding servicing, brand & reputation and commerce. It is Karlijn's ambition to generate revenue through social media.

Romar Bucur
is Project Manager Gaming & Social Media at KLM.

After working in the games industry, Romar Bucur joined KLM Royal Dutch Airlines in 2014 as Project Manager Gaming & Social Media. In this role, Bucur is in charge of all KLM game projects. He passionately believes that games and gamification can benefit the day-to-day business of any company.



KLM's first game »Aviation Empire« is a 3D strategy game in which players run their own airline.

larger audience to spread the KLM brand even further. This might sound unnecessary to Europeans, since KLM is pretty well known here, but in territories like North America, KLM is not yet a household brand.

Co-Production

When the decision was made to go for a casual game, developer Little Chicken pitched six different concepts. We really liked the idea of flying a paper plane, because it stays close to our core business of flying. From there on, the whole process was one of co-production. Even though KLM does not have its own in-house development team, we were closely involved in every aspect of making Jets. We do know social media and our fans like no other and we had various ideas for the game. We combined our strength in social media with Little Chicken's game design expertise. Every two weeks we sat together for a Scrum demo and reviewed a new build of the game to decide on the next development steps. This is a much more hands-on way of making a game than most brands do. Being involved in such a level asks for a firm commitment of KLM, in both time and money, but a work for hire construction where the developer calls all the game design shots doesn't work for KLM. We really want to be part of the development.

Play-testing

The same goes for play-testing. Instead of hiring an outside company, KLM organized a play-test of the beta version of Jets together with Little Chicken. KLM reached out to the players of »Aviation Empire« and our followers on Facebook and Twitter. Out of the large number of applications, we picked a diverse test group of around 200 people, based on age, gender, location and the kind of device they owned. The test group had access to Jets for a week. Testing was not restricted to certain hours; players could fit it into their daily schedule the way that suited them best. The test-build had a special in-game feedback button. That way the developers knew exactly where the player was when having a question or experiencing issues. After testing, we asked players to fill out an online form with more specific feedback on art style, music, sound, gameplay and monetization. The results showed that »fun-wise« we were on the right track, but the testers gave us some valuable feedback that helped to further improve the game. Both the play-test itself and the feedback showed that monetization could do with some tweaking.

Monetization

KLM already had experience with monetizing a Free2Play mobile game, since »Aviation Empire« also has in-app purchases. However, Jets is a very different kind of game and that requires a different monetization strategy. Together with a monetization expert and the developer we sat down to see what would be a good price balance for different items. For »Aviation Empire«, we made some mistakes in regard to monetization. For instance, we offered packages of game currency, but those

Jets is a mission-based endless flyer for mobile devices, in which players lead their paper plane through an obstacle-ridden cardboard world. The game also offers a turn-based multiplayer mode in which players use their social media account.

KLM Royal Dutch Airlines

KLM Royal Dutch Airlines was founded in 1919, making it the world's oldest airline still operating under its original name. In 2004, Air France and KLM merged to form AIR FRANCE KLM. The merger produced the strongest European airline group based on two powerful brands and hubs – Amsterdam Airport Schiphol and Paris Charles de Gaulle. Retaining its own identity, the group focuses on three core businesses: passenger transport, cargo and aircraft maintenance. The KLM network connects the Netherlands to every important economic region in the world and, as such, serves as a powerful driver for the economy.

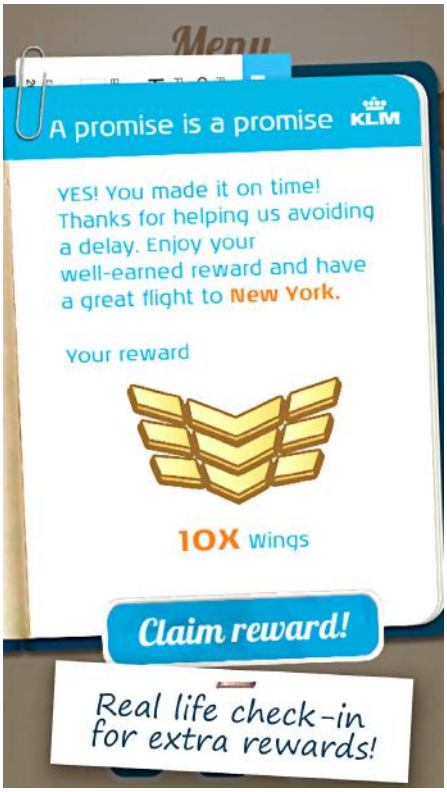
prices did not balance with the prices of separate items. This lesson taught us to think about monetization early on in the development process. Some people might call KLM games adver-games and believe that in-app purchases do not belong there, but our games are designed as entertainment games and branding is much less obvious than in adver-games. Moreover, the core of adver-games is to sell the brand, where the core of KLM games is fun, and by entertaining people, we get them engaged with the KLM brand. Both »Aviation Empire« and Jets can be played without paying, but through in-app purchases, levels and items can be unlocked faster. We're not in gaming for the money, but we do believe that it should be possible to earn our investments back and discover a common ground for future investments by adding in-app purchases.

Link to the Real World

As in »Aviation Empire«, Jets also has a link to the real world. Connecting our games to the real world is something KLM strongly believes in. When we started developing »Aviation Empire«, the link to KLM was that players run their own airline, but that didn't feel »connected« enough, so we added GPS check-ins. Players who fly to a KLM destination can check-in in the game and by doing so unlock that airport in their game. With Jets, we took it a step further and used gamification to influence passenger behavior positively. Players who buy a ticket on a KLM flight are rewarded Wings, the game's currency. Players who fly via Amsterdam Airport Schiphol can even receive more Wings by arriving at their gate on time. This could help to avoid delays. Jets sends passengers notifications to be on time.

To make this link with the real world technically possible the game has to know if a player has booked a flight, at what time the player needs to be at the gate and the current location of the player. Passengers can use their social login to book KLM flights. When the player logs in to Jets with the same social media account, the game can query the KLM servers to see if they have any upcoming flights. If this is the case, the player gets an in-game pop-up rewarding him for booking a flight with KLM and telling about the extra rewards they can receive for being at their gate on time. Notifications are set to remind the user of their flight and the in-game rewards. When departure of the flight is a certain amount of hours away, the location services are activated.

To be able to determine whether a player is at their gate on time, the game needs to know the right gate and the time the player needs to be there, as well as the current location of the player. For this we use a relatively new technology that KLM is developing. This Customer API allows KLM apps, and in future possibly also third-party apps, to get customer data in a safe and reliable way. When a user



Players who fly via Amsterdam Airport Schiphol get rewarded with Wings, the in-game currency, for arriving at their gate on time. This could help to avoid delays.

logs in, Jets queries this API and the first flight in the player's reservations on klm.com is returned to the game. For determining the player's location we use the Indoo.rs SDK. The same SDK the KLM navigation app uses to help passengers to find their way from gate to gate at Amsterdam Airport Schiphol. This SDK uses low-energy Bluetooth beacons that are located at Schiphol to find out in what part of the airport the user is. When the game detects that the player is on time, the final in-game pop-up is shown and the player receives the reward. For now the gate rewards is only available at Amsterdam Airport Schiphol, but when technology progresses worldwide, it might even become possible to roll out this feature at other airports.

The future

So what's next for KLM and games? When this article was written, Jets was recently released and it is too early to make any DLC announcements, but we plan on further support for the game. It's also too early to say what the more distant future will bring for KLM and games. However, one thing is sure – our journey into the world of games has just started. Thanks to KLM's innovative spirit, more ways will be discovered to integrate games with our social media strategy.

Karlijn Vogel-Meijer, Romar Bucur

Little Chicken Game Company

Little Chicken is a Dutch game developer based in Amsterdam. The company was founded in 2001 and has since then been developing both applied and entertainment games. One of their recent entertainment projects, besides Jets and Aviation Empire, is SXPD: Extreme Pursuit Force. SXPD was directed by games industry legend David Perry, and in collaboration with graphic novel writer and artist Duke Mighten

AN INDIE STUDIO TURNS GLOBAL PLAYER

Serbian developer Nordeus reached 110 million players worldwide in only five years with its football manager game Top Eleven. Here the company shares insights in how they reached this success, how the company evolved and how the team keeps the game fresh over the years.

Dusan Stevanovic
is Unity Developer
at Nordeus.

Dusan Stevanovic has joined Nordeus while still studying for a Software Developer Engineer degree at the School of Electrical Engineering on Belgrade University, as part of the Flash client development team on »Top Eleven«. He worked on the implementation of new features of »Top Eleven«, but also contributed to other projects in Nordeus. Recently, Dusan was part of the team responsible for the new version of the »Top Eleven« client in Unity. He still works on improvements for »Top Eleven«, but also on utility features for all Unity projects in the company.

Misa Jovanovic
is Software Developer
at Nordeus.

Misa Jovanovic is a Software Developer at Nordeus with plenty of experience working in Unity. He joined Nordeus during undergraduate studies two years ago, where he started working on the »Top Eleven 2015« project. During his work on »Top Eleven 2015«, he was responsible for many elements of the GUI system used in Nordeus, including NPrefab system for nested prefabs and fast scene deserialization. Currently, he is working on new projects in Nordeus.

The first steps are always the hardest. That was an experience the Nordeus Team also had to make, especially as an indie studio breaking new grounds as the first developers to create a cross-platform mobile game. With the football manager »Top Eleven«, the Nordeus Team created the biggest cross-platform sports game of the world and is considered a pioneer of the mobile games industry.

But every company is only as good as the people working there. Nordeus places a lot of emphasis on employee satisfaction. From recruiting to building a team that actively embodies the company culture, Nordeus is putting their employees in the focus.

The Challenges of Unity Development

»Top Eleven« brings a unified gaming experience on multiple platforms. Initially, the game started as just browser-based title working on top of the backend infrastructure, but soon expanded to iOS and Android devices.

Every feature had to be developed three times in regard to the various platforms, which resulted in having many single-technology oriented teams in the company.

This led us to the decision to do a ground-up rewrite of the game, aiming to solve the following issues:

- A single code base supporting multiple platforms
- Easy expansion to new platforms
- Having the same look and feel on all devices
- Improving visual fidelity

At the same time it was important to:

- Keep quality of the game
- Preserve existing user base
- Maintain the current performance and game responsiveness

We started by researching different multiplatform solutions and creating different prototypes. Finding a solution that would satisfy our needs for a single code base was all but easy. In the end we decided to go with Unity, even though we were aware of its 2D UI system shortcomings.

GUI problems

Options for creating user interface at that time using Unity were really limited, so we turned to NGUI, which was the best UI library for Unity available back then. The lack of standard interface components made creating the first scene quite demanding, but even worse was the fact that after finally succeeding, we only managed to get around 3 FPS on low-end devices. Profiling the code and solving a lot of quite demanding performance problems didn't give us the much-needed boost. The UI system was eating up way too much processor time,

and we spent months just optimizing the code until it reached acceptable performance.

Rendering was no different. When you have a lot of small images, you should combine them into one big »atlas« image, which drastically improves performance. However, a lot of content in »Top Eleven« is downloaded in-game, like user emblems and jerseys, so we had to make in-house »dynamic atlases«. These batch downloaded images into bigger atlas images while the game is running. With careful use we got three to eight times higher FPS and three to four times less memory consumption for textures.

Rediscovering the build process

While scenes finally started working with decent FPS, the application and scene loading times were exceptionally long (a couple of seconds on high-end devices). Our scenes can consist of thousands of UI elements and this is not something Unity was optimized for.

Luckily for us, Unity was flexible enough so we could solve this. We implemented our own scene serialization system with the following principle: Every class has its automatically generated, highly optimized code for serialization and deserialization. This code is located in the class, so it can access all serialized fields directly. For example, we have a class with a string, two floats and a reference as a serialized field. While we are building, we will generate one method that will write this data in that order into a binary file. During the run time, instead of reading the unity scene file, we use another generated method to read that string, floats and reference in that order from binary file.

Everything was working the same as in Unity, but every time we built the application we would serialize Unity scenes into our own binary format. We were amazed to find out that we got around ten times faster performance.

Making it work on tiny screens

The app was starting to get into shape, but we had to cover a huge range of mobile screens. Instead of going the usual way of making multiple versions of scenes for different sizes, we decided to make UI elements auto-adjust size to screen.

Each UI element had dimensions assigned in both pixels and millimeters. Buttons can have a size of »50 pixels and 5 mm«; if we had only pixels, the UI elements would look tiny on modern high dpi devices. Millimeter value is converted into pixels using Screen DPI, while the original pixel size is scaled to current Screen Resolution. The final button size would be generated based on the bigger solution of these two. We were quite satisfied with this, as it considerably increased the speed of UI building.

Work smart not hard

In Unity we take parts of scenes and save them as »prefabs«, which are basically reusable building blocks. If your application has a standardized button that appears in all scenes, you want to make a prefab for that. Trouble is, you can't make composite prefabs in Unity. If you add »standard button« into »standard pop-up«, that button will stop syncing with changes on the original »standard button« prefab.

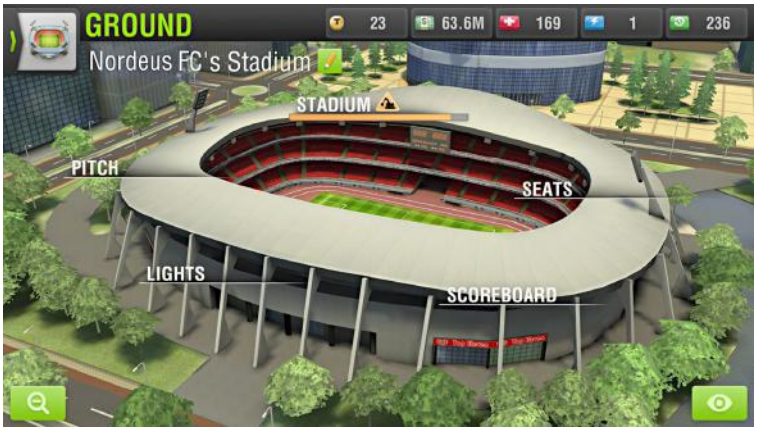
This is a major issue when developing a UI heavy application. If we could overcome this, the benefit would be huge, so we invested into an in-house system for handling prefab-inside-prefab situations. Again luckily, the area where Unity editor shines is its modding and extending support. We called these new prefabs »NPrefabs« (N as in Nordeus) and added a lot of functionalities on top of it.

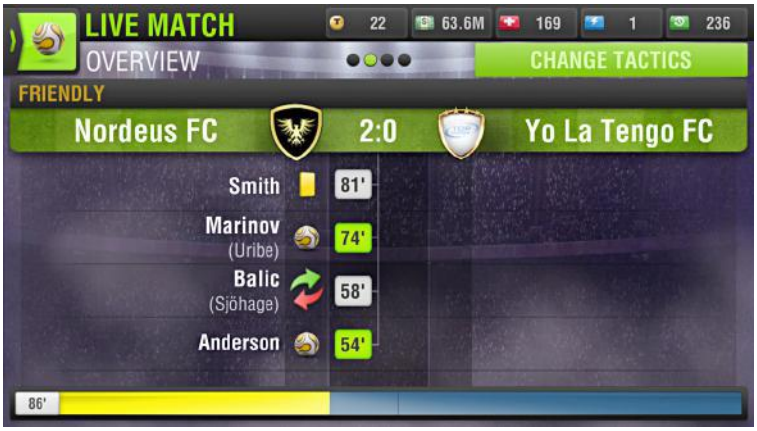
All that starts well ...

... ends well. The project was finished successfully and we have gained a lot of experience by making all of these solutions. Today, all these cool GUI features empower not only »Top Eleven«, but all of our future games.

Nemanja Posrkaca
is Project Manager in Marketing at Nordeus.

Nemanja Posrkaca entered the world of online marketing in 2010 with his first profitable website project. Since 2011, Nemanja has worked for Nordeus, developed the social media scope within the company and eventually lead the social media team. Today, he works as the Project Manager in the Marketing (or Publishing) team.





»Top Eleven« started as a small football manager game on Facebook about five years ago. Today it is available on all mobile devices, has around 110 million players and can count on the support of a lot of major football clubs around the world.

Nikola Cavic
is Head of
Business Development
at Nordeus.

Nikola Cavic is currently managing all aspects of business development and publishing. Prior to Nordeus, he spent five years with CCP Games where he was responsible for sales and global distribution of »EVE Online«, and has been involved in a number of international projects with global leaders in the gaming industry. Nikola joined Nordeus in February 2012 and has been playing a key role in Top Eleven's international expansion and corporate development ever since. Nikola holds an M.S. degree in International Business & Marketing from the University of Reykjavik.

Aleksandar Aleksic
is Game Producer
at Nordeus.

Ever since he got his first console in 1995, Aleksandar Aleksic became passionate about video games. Later on, he studied software engineering and joined Nordeus immediately after he graduated, where he worked as a software engineer on »Top Eleven«. His passion for making games and leading people was recognized, and today he is on the position of the Game Producer, leading the development of »Top Eleven«.

Milena Dulanovic
is HR Manager
at Nordeus.

Milena Dulanovic is handling recruiting of talented professionals in all offices around the world. Since people are the most valuable asset for Nordeus, Milena has a really important role in the Nordeus machinery as a recruiter and a contributor to Nordeus being awarded as the The Best Employer in the Balkans region for 2012 and 2013. She is always seeking to introduce something new and innovative in HR department and Nordeus as a whole.

Community Building

A game's social media channels can do a lot to improve the app's visibility and user experience.

The growth and success of Top Eleven's community was linear to Top Eleven's increasing popularity. This was certainly true in 2011 when the game started gaining real momentum. However, this growth was dependent on users being proactive and reaching out to find us. But we wanted to reach out and find them. In spring 2012, we had decided to utilize the amount of daily active users the app had and promoted the Facebook page in the form of a welcome pop-up in the app. The results were immediate and within a year we doubled our total from three to six million fans. Motivated by this success, we started growing our Twitter and YouTube channels using similar mechanics. Most recently, we grew our YouTube channel by 380,000 subscribers just in two days by engaging our users with an in-game pop-up competition that led to YouTube. Over the time, we realized that trying new and more engaging ways of communication with users is crucial for this process.

Growing your game's social media community is important, but just as important as you are able to hold on to it. To do this, we are engaging with them on a daily basis with specific content about the game and broader content about football. We constantly try new things and give them reasons to follow us across various channels. In a nutshell, we want our channels to improve their experience of »Top Eleven«, to help them start playing the game, and keep them engaged as long as possible. This is done through different types of content targeting different types of players.

User engagement does not stop here. Interacting through comments and tweets that are mentioning us is one more place where we are looking for feedback. If there is an opportunity for an interesting debate about football, or a particular feature of the game, we will partake. This type of engagement is extremely important. A lot of our »Top Eleven« social media community members are our most engaged users and their feedback is extremely valuable.

Studying their comments on our posts, tweets, and videos, gives us a valuable overview of where the game succeeds and where it can improve. Most importantly, we can then use the tools available to us to pass this feedback on to the developers and help improve the game and show to our users that the game is theirs just as much as it is ours.

Licensing and Cooperation in Pro Football

When creating a sports based game, the issue of licensing top brands in sports, always comes up as one of the key strategic decisions that needs to be answered before game design and development even starts. Having access to real clubs and real players can have a profoundly positive impact on the look and feel of the game. However, licensing also comes with its drawbacks, namely the licensing fees and all limitations of how the brand can be presented and interacted with, in the game itself.

When »Top Eleven« was just a sketch on paper and slightly more elaborate design in our heads, we decided to pursue development of the football management game that had no connection to the real leagues, clubs and players that we are fans of. At that time, we were a small startup, without any investments or financial backing, and the funds were barely sufficient to get us through the few months of the development. Licensing fees and costs involved in reaching out the clubs and leagues were absolutely out of our reach and we decided instead to make the »Top Eleven« based on the clubs that were created from scratch by our customers, featuring players that were made up either by the game or our customers.

There were no Messi's, Ronaldo's and other big names to draw your attention. Instead, you as a player had to look at the stats and attributes of each football player and make decisions based on that, whether or not they were a good enough fit for your team, instead of just going by the name of known football celebrities. In retrospective, it was a brilliant game design decision that allowed our players to be more immersed and engaged with their players and teams. Everyone had a unique football club with unique players that they had to take care off.

As »Top Eleven« grew constantly since its launch, we started receiving more and more requests from our players for some kind of integration of their favorite football clubs within our game. They liked the gameplay, but they still wanted to have an opportunity to show off their support of the favorite clubs. In 2012, we already had over three million active monthly players and they were rather vocal about their demands and we decided to try and talk with the best football clubs and try to secure their right and partnership for »Top Eleven«.

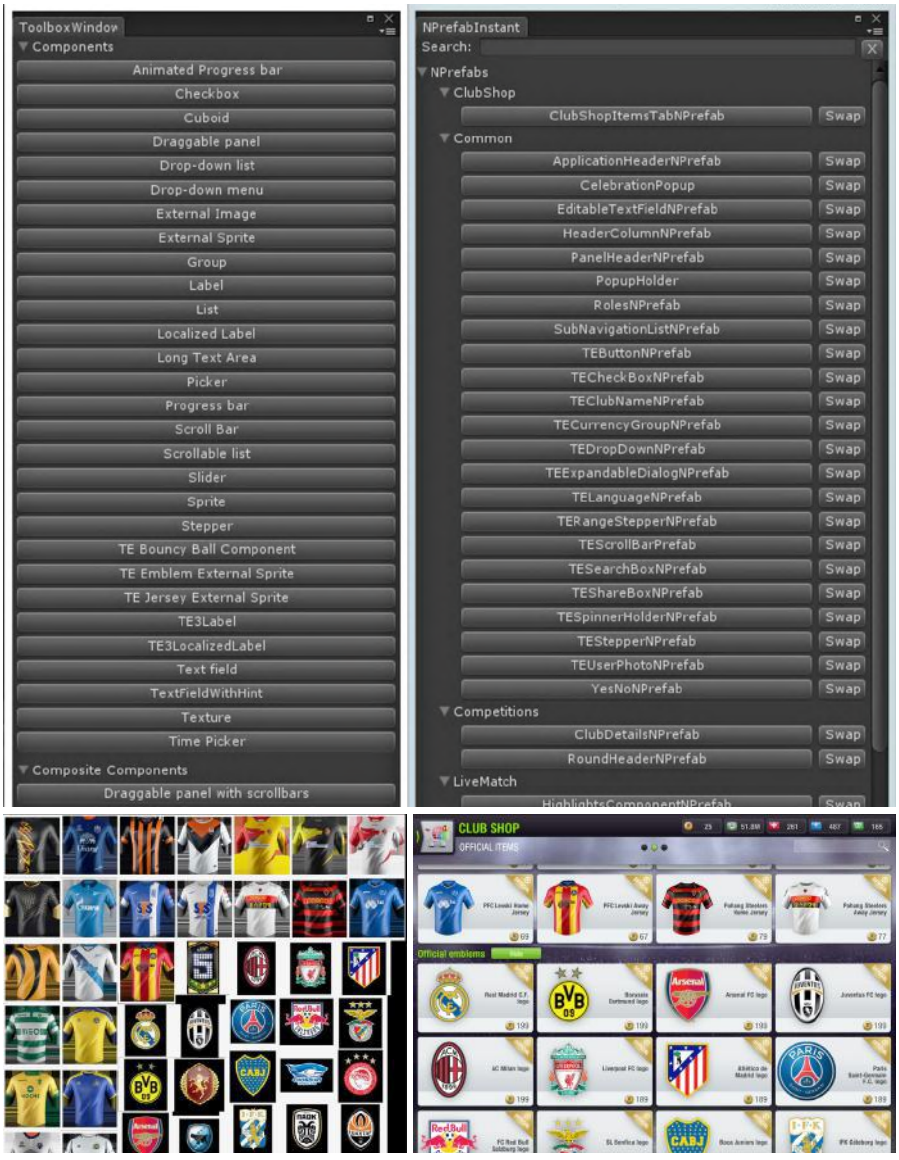
While sport clubs are very familiar with the licensing business, and even licensing to traditional gaming companies and titles for PC and console, they had almost no understanding for the free2play business model and how business terms had to change to account for that. They were still stuck in the old merchandising models and unable to accommodate different terms that were necessary for our kind of business. Many months later, thanks to the openness of clubs such as Real Madrid and AC Milan to adapt and recognize new business opportunities, we signed first licensing deals with them, securing rights for their virtual jerseys, emblem and the stadium.

While securing rights for images and names of their football stars was an option, we did not pursue it. Instead, we allowed our players to buy virtual jerseys and emblems of the clubs and show of their support to other »Top Eleven« players. Since then, we have acquired rights for

more than 30 of the best football clubs around the world and we continue to introduce new content and clubs all the time. Latest additions include the Champions League finalist Juventus, Borussia Dortmund and Paris St. Germain.

The business terms vary between the clubs, but they are usually the combination of advanced payment and royalty payments from the sales. We have found that it makes more sense for clubs to receive a part of the revenue from the sales, because it creates an incentive for the club to be more involved in the whole process and, in particular, in the promotional part of their presence within »Top Eleven«. This also tremendously helps with the approval rights when the club is involved and understands the game. Otherwise, it can be really difficult to explain why it is necessary or recommended to use a club brand in a certain way and wait for the approval rights.

When it comes to other benefits from these kind of partnerships, the most notable is the size of the potential new audience. Some of the most popular clubs have hundreds of millions of fans, and tens of millions of them are easily reached through their official social media channels. For a social game such as »Top Eleven«, access to a large target audience such as that, has proven to be a valuable promotional channel in increasing brand awareness and attracting new players to the game. We have also measured that the overall satisfaction with the game has increased with the addition of official football clubs in »Top Eleven« which encouraged us to invest more time and resources in this part of our business.



Nordeus had to make in-house »dynamic atlases« that batch downloaded images into bigger atlas images while the game is running. By doing so, the team got 3-8 times higher FPS and 3-4x less memory consumption for textures.

José Mourinho as a Brand Ambassador

Speaking of the licensing and partnerships with the best football clubs, our agreement with José Mourinho is an interesting and very relevant deal to this topic. José Mourinho has been a global ambassador for »Top Eleven« since February, 2013 and has been featured in our marketing material and in the game itself numerous times ever since.

Back in 2012, we were seeking a football celebrity that would be a good match to be the ambassador for »Top Eleven« to help us strengthen our brand. Considering that our gameplay revolves around players being in the role of football coach/manager, it was an easy decision to focus our search for the ambassador among the best football coaches, as opposed to football players. We wanted to send a clear signal starting with our marketing materials, through the game icon and over to the tutorial that »Top Eleven« is a game of coaching and management, and not about real time control of your players on the pitch.

At that time, José Mourinho was still at Real Madrid, our partner club, and was recognized worldwide as the best football coach. While some fans will question that statement, he was definitely the most popular and recognizable among the football coaches in the world and that was the quality we were looking for. He was »The Special One«.

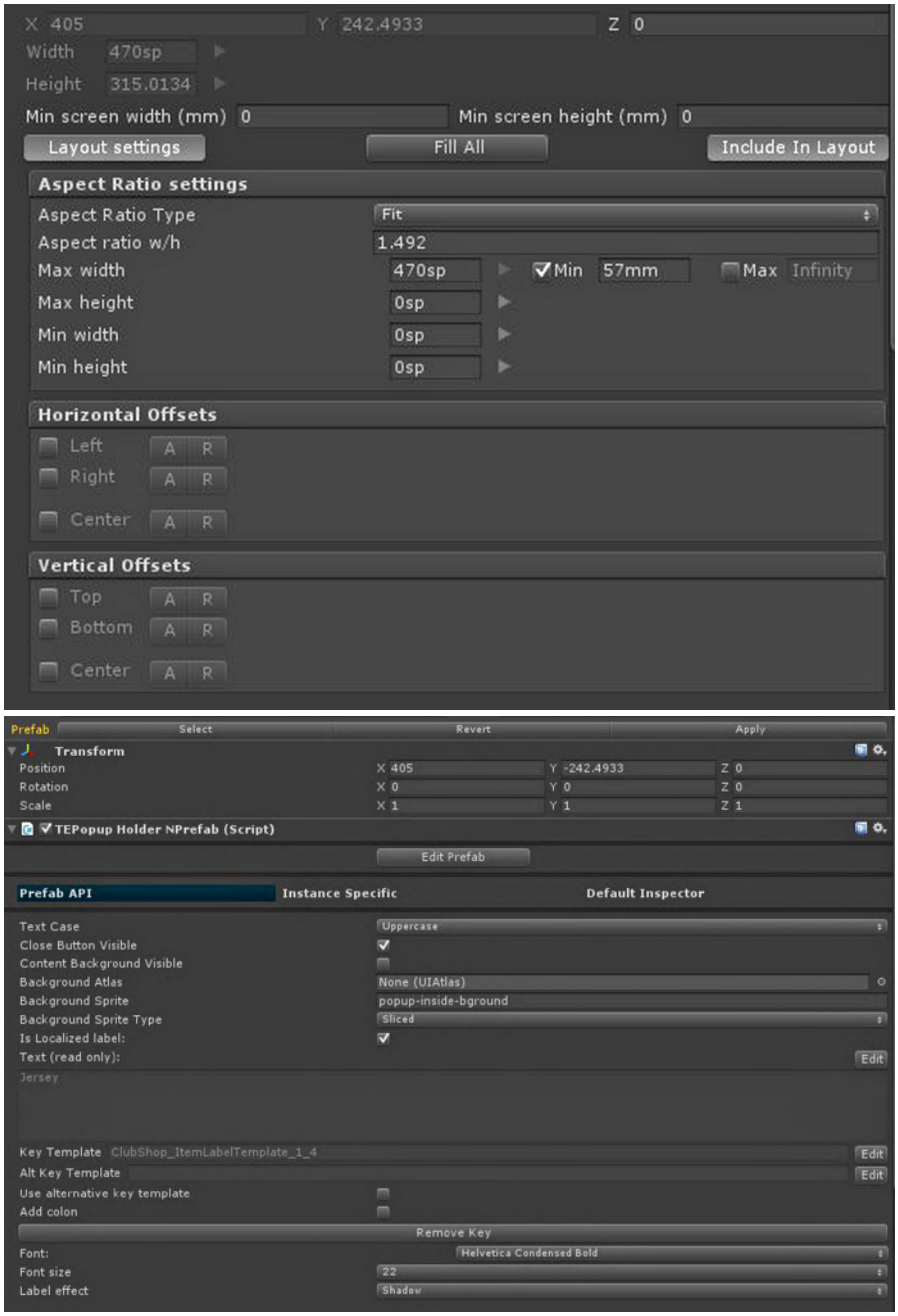
With José Mourinho as our ambassador, we entered a new phase in our marketing and raised it to a whole new level. We were now in a big league and being represented by the best football coach in the world, allowed us to greatly increase brand awareness for »Top Eleven« and increase both organic and paid user acquisitions, all over the world. It was a golden age for »Top Eleven« and this move has won us not only favor among the millions of players around the world, but also with our partners who applauded the move and created new opportunities for us to collaborate on.

Since then, we have done quite much with José Mourinho, both in terms of marketing and in-game activities. José is the friendly face that greets you in the game, and guides you through the tutorial. On the other hand, we try to collaborate often in the activities outside the game, surrounding the events, promotions and PR about »Top Eleven«. Our latest collaboration with him revolved around the »Top Eleven 2015«

TV commercial campaign, where we aired a full production »Top Eleven« TV commercial for the first time, featuring José Mourinho. The commercial was broadcasted across UK and Germany over a period of six weeks and helped us get over one million views and the 400,000 subscribers on YouTube that we have today.

Naturally, working with celebrities such as José comes with its challenges. Organizing shooting sessions or interviews needs to be planned long term in advance, yet be flexible in the very short term due to unexpected changes that often happen. Working with brands also means that everything involving that brand or in our case celebrity, needs to be approved by the rights holder. Their key task is to protect and increase the value of the brand and as a result, it can lead to delays on the development side until everything is perfect and to their satisfaction. Ultimately, this is a positive thing as it focuses on the quality and authenticity, and you just need to account time for this in the planning.

Despite all those nuances that come by working with a celebrity, for us, it has been a rewarding experience and one that we are proud of. We know that José is a fan of »Top Eleven« as well, and we are looking forward to continue collaboration with him in the years to come.

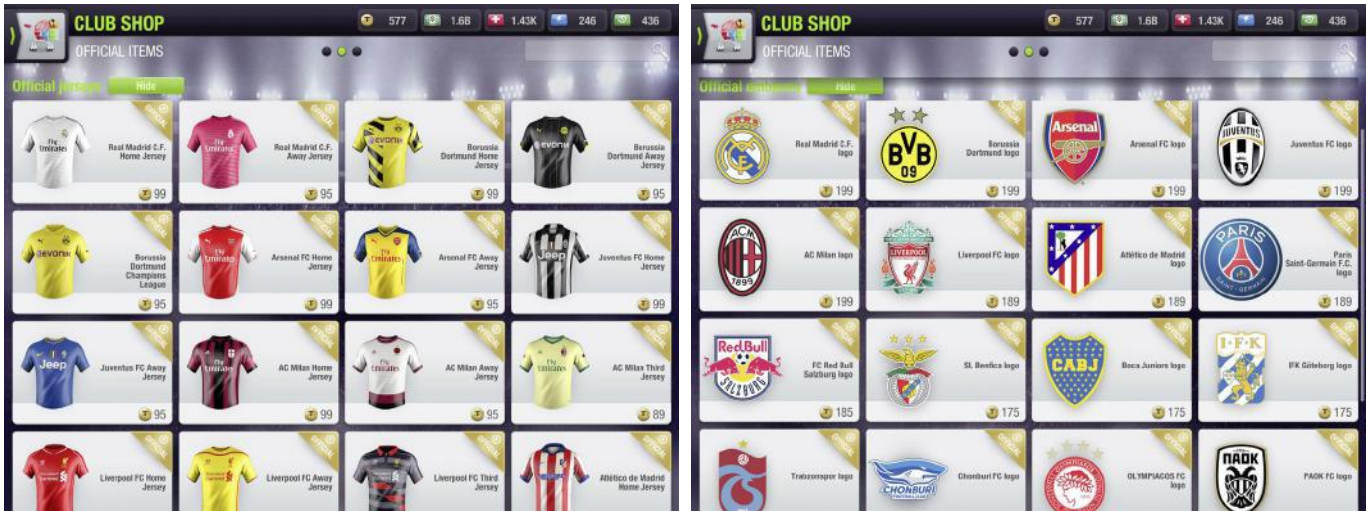


As Nordeus aimed for a lot of different devices at once the team had to find some work-arounds in Unity. For example they introduced their own prefabs and defined button sizes by pixel and millimeter so that it looks the same on any display size.

Top Eleven 2015

For the new and updated version of our game – »Top Eleven 2015« – we had different goals. On the one hand we had high expectations from our brand »Top Eleven«, and on the other hand we had goals that are more production related. With the launch we managed to raise brand awareness, reach broader audience, make the »Top Eleven« brand more appealing and reactivate part of lapsed users. For the production, we set following goals:

1. To be a mobile first game and truly cross-platform: »Top Eleven« started as a flash game for Facebook, and soon after it was optimized for mobile platforms – first Android and then iOS. The initial mobile clients were missing some functionalities of the flash version, and for many years they were behind it, in terms of features. For example, the mobile versions didn't have the »Direct Transfers« feature, not until the launch of »Top Eleven 2015«. So, with the new update we wanted to shift to the mobile first mindset, and that everything we do is primarily implemented on major mobile platforms. Unity allows to do so, so we are now offering the same gaming experience across all platforms and all devices, which is in line with our mission.
2. Free up resources and have only one team working on the product: By achieving this, we gained more teams working on new games. Before the update, since we had three different platforms developed in native technologies, we had three different code bases, and we needed three different teams to work on the product. This was an utterly inefficient use of resources and people's talents. So, the aim was to use a cross platform technology, such as Unity, and have only one team, fully empowered to work on the product. Now, with just a few modifications we can use the same codebase to build for different platforms.
3. To have a 2015 look and feel: In order to have the same gaming experience everywhere, you need to have a consistent and modern visual style. The new »Top Eleven 2015« is beautiful, fully utilizes the power of Unity 3D engine, allowing us to have smooth transitions and animations, 3D ground and better effects. Additionally, the new look and feel helped us reach more customers



»Top Eleven« started without having any licensing deal and therefore only offered made-up football players. Later Nordeus introduced real-life clubs so that fans could use their jerseys or emblems.

and improve brand awareness. New design combined with the updated promotion visuals made getting featured by the app stores much easier than it was the case with native and less visually appealing clients.

Nordeus as a Company

At Nordeus it is all about the people: Over the last five years our company grew together with its employees. A group of ambitious and creative people gathered together and decided to succeed in doing what they love the most – making games. On their way to and through success other people joined and brought Nordeus to what it is today – a company of 170 employees and five offices around the globe building the most played online sports game in the world. Simple as that. However, the back of that »simple« hides a lot of work and a clear vision of having the environment suited for the employees. It also goes the other way – bringing the right people to the company.

Recruiting at Nordeus means to find the perfect person for the position, for the team and for the company. Besides identifying knowledge and skills that a candidate needs to have, Nordeus' hiring team pays special attention to whether someone is a Nordeus fit or not.

»Nordeus fit« stands for respecting and having the same values that our company has: a person that loves games and making games, and that understands and cherishes teamwork and sharing ideas with the team. It also means that a Nordeus fit person is always in the mood for improving things, not afraid to take responsibility, as well as fail and quickly rise from the failure with new ideas.

Our teams are empowered and as much as we are one big family, each team has its own dynamics. In addition to being a Nordeus fit, it is important to assess whether a candidate is the right person for the team, whether he or she will easily accommodate to the team, bring additional value with skills and personality, and whether he or she will grow within the team.

The culture of learning is carefully nurtured in every office of our company. We invest greatly in the development of each of our employees. World class gaming company status goes side by side with world class learning opportunities.

We analyze the needs of both teams and individuals and provide them with opportunities to grow in the way that they think is the best for them. Apart from relying on the help of world renowned companies like Construx, Nielsen Norman Group and Kotler Marketing Group, we learn from attending conferences around the globe like GDC and Casual Connect; we learn from Nordeus library books, and most importantly we learn socially – from each other, by doing – trying and failing and playing together.

There is no budget limitation for Nordeus' people development and that is because we believe knowledge is priceless and a great investment in the future of our people and company.

Learning from each other is by far the most cherished way to learn in our company. We encourage people to experiment, try new ways to do their job and to share with others what they learned. Teams define what is the best way for them to learn. An interesting example is »Lunch & Learn«, initiated by our Analytics team. They get together once a week to share their knowledge on a specific topic, they choose or just watch some interesting educational video while enjoying their lunch.

Another example is »Open Doors« – presentations that we use to share our teams' projects, their achievements and failures with the rest of the company, or to present some interesting topic.

Artists are no different. In order to improve their skills and support each other constantly, our artists have »Daily Speedpaint Art Workshop« – they come up with all kinds of creative ideas and try to paint them in less than 30 minutes. In this way they practice developing ideas fast and putting all important elements on paper in small amount of time.

The secret of great success of our company is to always hire top talented people that love what they do, believe in Nordeus' values and vision and empower them to grow to the maximum of their potential.

Aleksandar Aleksic, Nikola Cavic, Milena Dulanovic, Misa Jovanovic, Nemanja, Posrkaca, Dusan Stevanovic

Introducing José Mourinho as the face of »Top Eleven« was a big thing for Nordeus. Not only did this boost the amount of players and brand awareness but is also a nice feature in-game as the famous coach guides players through the tutorial.

MUSIKKOMPOSITION IN VIDEOSPIELEN

Die Art der Spiele bestimmen die Art der Musik. Russell Brower beleuchtet die Unterschiede der Musik von Diablo 3, World of Warcraft und Hearthstone und erklärt, wie Leitmotive entstehen.

Russell Brower ist einer der Hauptverantwortlichen für die Musikkomposition bei Blizzard.

Russell Brower komponiert für Spieleentwickler Blizzard Entertainment. Neben der kompletten Musik für »Diablo 3« stammen auch große Teile der »World of Warcraft«- und »StarCraft«-Musik aus seiner Feder. Bevor er seine Stelle bei Blizzard antrat, war er unter anderem Principal Media Designer bei Walt Disney Imagineering und designte Sounds für »Batman: The Animated Series«. Seinen Kompositionen verdankt der Amerikaner mittlerweile drei Emmys.

Making Games Musik in Spielen ist ein riesiges Themengebiet. Uns interessiert zunächst das Komponieren von Leitmotiven, das eine Huhn-oder-Ei-Frage zu sein scheint. Schreiben Sie zuerst das Thema oder komponieren Sie basierend auf dem jeweiligen Spiel?

Russell Brower Eine gute Frage. Bei »World of Warcraft« zum Beispiel arbeiten wir mit mehreren Komponisten zusammen. Ich bin einer von ihnen, aber gleichzeitig auch Hauptverantwortlicher. Das bedeutet zwar nicht, dass ich den Komponisten minutiös vorgebe, wie sie zu komponieren haben, doch es ist schon wichtig, eine bestimmte Stilrichtung einzuhalten. Dadurch haben wir die Möglichkeit, einzigartige Stücke zu erschaffen. Bei »World of Warcraft« beginnen wir mit der Prämisse, dass durch die Musik eine Geschichte erzählt werden soll. Danach setzen wir uns zusammen und gehen die Stücke durch. Wir sehen diese Phase als Austausch, mit Konkurrenzdenken hat das nichts zu tun. Mittlerweile kennen wir uns sogar schon so gut, dass wir die Sätze des anderen beenden. Nur sind es hier nicht wirklich Sätze, sondern Musikstücke. Am Ende weiß ich meistens gar nicht mehr, wer eigentlich ursprünglich was geschrieben hat. Ungefähr in der Mitte dieses Prozesses stechen dann die stärksten Titel heraus. Würden wir uns mit dem Vorhaben hinsetzen, jetzt sofort ein Leitmotiv schreiben zu müssen, ständen wir unter enormem Druck. So fühlt sich das Ganze viel organischer an. In den neueren Stücken versuchen wir auch immer, eine Art Hommage an die früheren Werke einzubauen; Stücke, die uns oder den Fans besonders gut gefallen haben. Lustigerweise hören viele das Leitmotiv überhaupt nicht, weil sie meistens nur kurz im Hauptmenü sind. Aber für diejenigen, die zum ersten Mal ins Spiel kommen und sich einen Charakter erstellen, will ich musisch darstellen, wo die Reise hingeht. Die Zusammenstellung der Motive dauert dann in der Regel nicht länger als ein Wochenende, denn die Hauptarbeit ist ja schon erledigt.

> »Durch die Musik soll eine Geschichte erzählt werden.«

Making Games Also geht es von vielen kleinen Teilen zu einem großen Ganzen?

Russell Brower Auf jeden Fall. Vor allem bei Projekten wie »Mists of Pandaria« und »Warlords of Draenor«. Bei »Wrath of the Lich King« hingegen hat sich das Thema relativ schnell herauskristallisiert, aber das lag auch daran, dass wir einen so charismatischen Antagonisten hatten.

Making Games Wenn Sie die kleinen Dinge zuerst machen, schließt das auch beispielsweise Bewegungsmusik für Blutelfen mit ein?

Russell Brower Ganz genau. Ich wollte unbedingt die Blutelfen inszenieren, und einer meiner Kollegen die Draenei. Wenn es neue spielbare Rassen zu betiteln gibt, stürzen wir uns meist drauf, denn das bedeutet, dass wir etwas neu erschaffen können. Natürlich macht es

auch Spaß, alten Musikstücken neuen Schwung zu geben, aber neue Rassen, Länder oder Feinde bieten nun mal mehr Möglichkeiten.

Making Games Liegt Ihnen zu dem Zeitpunkt schon eine Animation oder Skizze der Blutelfen vor?
Russell Brower In diesem Fall hatte ich nicht mehr als eine Charakterbeschreibung und ihre Ursprungsgeschichte. Im Zweifelsfall gehe ich dann fast immer noch zu unseren Writern und erfrage mir ein bisschen Hintergrundwissen. Die Blutelfen sind zwar sehr schön, haben allerdings einen sehr traurigen Hintergrund. Deswegen habe ich mich für ein Cello-Solo entschieden. Das hat einen wunderschönen Klang, kann jedoch auch sehr gut Leiden ausdrücken. Manchmal macht so eine Herangehensweise die Komposition sehr einfach. Oder ich benutze einen Tritonus, der auch Teufelsintervall genannt wird. Gespielt sorgt er genau dafür, dass wir uns beim Zuhören leicht unwohl fühlen, das Stück aber trotzdem noch melodisch klingt.

Making Games Und wenn Sie komponieren, nutzen Sie Tools, die Töne und Musik generieren? Oder spielen Sie alles selbst ein?
Russell Brower Das unterscheidet sich tatsächlich von Komponist zu Komponist. Die Musik bei Blizzard ist jedoch komplett handgemacht. Wir haben bis jetzt noch nicht einmal mit Musik-Algorithmen experimentiert. Was die Bereitstellung der Noten angeht, da hat jeder seine eigenen Vorlieben. Ich sitze am liebsten mit Block und Stift an meinem Klavier. Das hat den Vorteil, dass dieses Instrument eine größere Bandbreite an Tönen bietet als ein Orchester. Richtig gespielt bildet ein Klavier eine wunderbar neutrale Basis, auf der ich aufbauen kann. In meiner Vorstellung stehen bestimmte monofone Melodien dann für ein Horn, eine Trompete oder ein Cello. Mit dem gedrückten Dämpferpedal kann ich auf einmal all die Töne zusammenspielen, für die man normalerweise ein ganzes Orchester benötigt. So lassen sich viel leichter Harmonien herausarbeiten. Dadurch höre ich es zwar nicht, bis es letztendlich eingespielt wird, aber dafür ist der Moment dann umso besser. Einige Kollegen hingegen arbeiten wieder ganz anders. Die nehmen die Passagen mit dem Keyboard auf und fügen hernach alles direkt zusammen. Ich bin da wahrscheinlich etwas altmodisch. Wenn ich die Übersicht behalten will, kann ich die Notenblätter besser auf meinem Esstisch ausbreiten als auf einem Monitor. Zwar habe ich dann nicht immer die Visualisierungen auf dem Schirm, doch das ist nicht zwangsläufig was Schlechtes.

Making Games Abgesehen von »World of Warcraft« haben Sie auch an vielen anderen Projekten mitgearbeitet, zum Beispiel an »Diablo 3« oder auch der Musik zu »Hearthstone«. Wie bringen Sie das alles unter einen Hut? Wie unterscheidet sich die Arbeit an einem komplett durchgeskripteten Spiel wie »Diablo« von einem Online-Multiplayer wie »World of Warcraft«?
Russell Brower Es kommt immer drauf an. Es gab Zeiten, da habe ich jedes Projekt persönlich betreut, aber dazu haben wir mittlerweile einfach zu viel zu tun. Für »Hearthstone« habe ich beispielsweise zwar den Komponisten ausgesucht, hatte jedoch nicht die Zeit, eigene Stücke zu schreiben. Bei »Diablo« war ich damals wesentlich mehr involviert. Um zur zweiten Frage zu kommen: Ja, die Unterschiede sind enorm. Diablo ist im Gegensatz zu WoW kein Open-World-Spiel und verfügt über jede Menge Filmsequenzen. Dadurch hatte ich nicht nur die Möglichkeit, Charakterleitmotive zu erstellen, welche die Persönlichkeit der Figuren widerspiegeln, sondern auch spezifische Momente mit Musik zu untermalen. In Online-Multiplayer-Titeln wird die Hälfte der Handlung durch den Spieler kreiert und ist somit für jeden unterschiedlich. Die Handlung in »Diablo 3« ist viel linearer. Jedes Ereignis, von deiner Ankunft in Tristram bis hin zum großen Showdown im Himmel, ist geplant. Genau wie die Entwicklung der Figuren. Lea beispielsweise macht eine enorme Charakterentwicklung durch. Der Moment, in dem sie realisiert, dass ihr Onkel nicht verrückt war, sondern die ganze Zeit recht hatte und es von nun an ihr obliegt, sein Erbe weiterzuführen, ist ein einschneidendes Erlebnis. So etwas gibt es in WoW nicht. Die Inszenierung jedes einzelnen Augenblicks passiert viel zielgerichteter und Gefühle können direkter übermittelt werden. Am schönsten ist es, wenn wir Menschen damit berühren können.

Interview: Ann-Kathrin Kuhls

Das Leitmotiv der WoW-Erweiterung »Wrath of the Lich King« kristallisierte sich durch den Antagonisten schnell heraus.

> »Wir haben noch nicht einmal mit Musik-Algorithmen experimentiert.«

In dem WoW-Addon »Warlords of Draenor« sind die Blutelfen enthalten, deren Leitmotive Russell Brower komponierte.

X-MERCS TURN-BASED STRATEGY MEETS MMO AND FREE2PLAY

If you start to develop an ambitious game a lot of things go wrong. Game Insight looks back at the 18 months long development of X-Mercs where a lot of engine changes, new tools and technologies challenged the team to reach its goal.

Oleg Pridiuk
is Games Industry Evangelist at Game Insight.

Oleg Pridiuk is a part of Game insight's Strategic Partnerships team, working within the industry to advance Game Insight's position as a leader in producing high-quality, hardcore 3D games. Prior to joining Game Insight, Oleg spent six years at Unity Technologies as both Mobile Specialist and Technology Evangelist where he worked globally with hundreds of game developers and publishers.
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We are to talk about a Free2Play 3D tactical turn-based MMO strategy game that has been in development for more than 18 months. We designed it multiplatform with a first appearance on iOS. And we used Unity game engine for development. In this story we'll cover our Unity experience, pipeline processes, art, performance and project design solutions.

Game Scope

Our ambitions were aimed for the biggest hardcore strategy titles on mobiles. We planned for a massive campaign with 250 locations, 25 different guns, and 50 unique enemies available from the start. And then we wanted a feature-rich PvP with another 20 weapons available from the start. And we designed the game for regular content updates. Does this sound pretty huge already? So let's get deeper in the story.

Project Planning

We started »X-Mercs« with Unity 3.5, at that point no one could tell if we could make it with that engine. There were basically no shipped projects of the scale as our ambitions. So after a successful prototyping phase we went with Unity yet allocated space for a plan B. We designed the game in a modular way and wrote own technology for all critical elements to keep ourselves somewhat engine agnostic. No Unity physics, no Unity networking, game logic split into libraries, animations made in Maya, etc.

Most of our choices worked out well and proved to be good design decisions, even though we are still with Unity and are not planning on switching the engine. Some choices that appeared absolutely meaningful at the time, like the Scaleform for a GUI, resulted in a painful switch later on. But this is just what happens when you are on a 18+ months project: while you are heads down on the game, the industry moves on and you have to allocate time to shift your technology stack along the industry vibes.

So yes, the project started when Unity 3.5 was the latest final version. We created a prototype and designed the whole thing with Unity 3.5. With Unity fixing bugs and creating new features with the new versions we decided to upgrade to the Unity 4 at a certain point that was quite late in development and postponed the project release. We moved to Unity 4.5 beta then to the Unity 4.6 family, which is where we are now. We were able to move from mono runtime to IL2CPP to ship the 64-bit binary, as Apple requires, and we enabled Metal support.

The main reason for a first heads up on the Unity 3.5 to Unity 4 upgrade was a need to

»X-Mercs« is a mixture of different genres like turn-based strategy and MMO and at the same time was developed for mobile devices to be Free2Play - it will be released to iOS in the coming months, if not weeks.

switch the GUI from Scaleform. When we started the project, Scaleform felt like a good option for our GUI heavy title, and we actually had 70 to 80 percent ready as Scaleform support for Unity went kind of dead. So we evaluated Unity GUI, we really wanted something backed by Unity at that point, and gave it a shot. The new Unity GUI technology felt promising, yet still in beta, as we were at a point to make a choice. This is how we appeared on the Unity 4.5 beta. So while we had the luxury service of regular bugfix releases and fast iteration times with new GUI features, we also took the pill of a beta quality product. This added stress on the team and we had to adapt to new vibes of the Unity beta release processes. That said, we are happy with Unity GUI now, but we would not repeat the adventure again.

As we upgraded to Unity 4.6 later on, we could check out Metal and IL2CPP technologies, that we knew we would need to adopt before we launch the game on iOS. As you know, the mono version Unity uses, does not support 64-bit runtime, as Apple requires now, so we had to invest tremendous efforts to switch our almost finished game to the new runtime. In fact we had to sit together with Unity devs to get it to the loading screen, and then worked together to get past it, stabilize the build and after some dozens of bug reports and new builds later, the game was able to run well on IL2CPP. Our team learned so much about p-invokes and compilers then, we could probably write a book about that. Our goal however was to ship the game.

The short summary of what we learned would be: you have to take care about the way you design your scripts and game logic. Unity's mono utilizes a subset of .NET Framework 2.0, and some more modern mechanics may work in the editor. However modern C#-style, heavy use of generics and other relatively new code design technologies that relate to dynamic code generation, may face certain challenges with IL2CPP. Also often managed-unmanaged memory jumps may cause unexpected lags, but Unity has docs and manuals of good practices here.

Mecanim animation system was a major new feature with Unity 4, and then with Unity 5 it became an essential core functionality that feels like it has been there forever stable and cool to use. »X-Mercs« was designed with Unity 3 functionality in mind though, so we rely mostly on what is called now a »legacy animation«, a feature being slowly phased out with new Unity versions. All relevant features implemented after the bespoken Unity 4 switch are on Mecanim.

These points are here on the front line to highlight the complexity of a long development cycle for titles as ambitious as »X-Mercs«. You have to take into account that technology and industry go forward as well as the 3rd party technology stack you rely on. You may need

Development for the game originally started with specific devices in mind. Over the years hardware as well as software changed as did the scope of the game. In the end minimum requirements were way higher than planned.

The user interface was created using Scaleform in the beginning. Later on the team had to switch to Unity's own GUI solution.

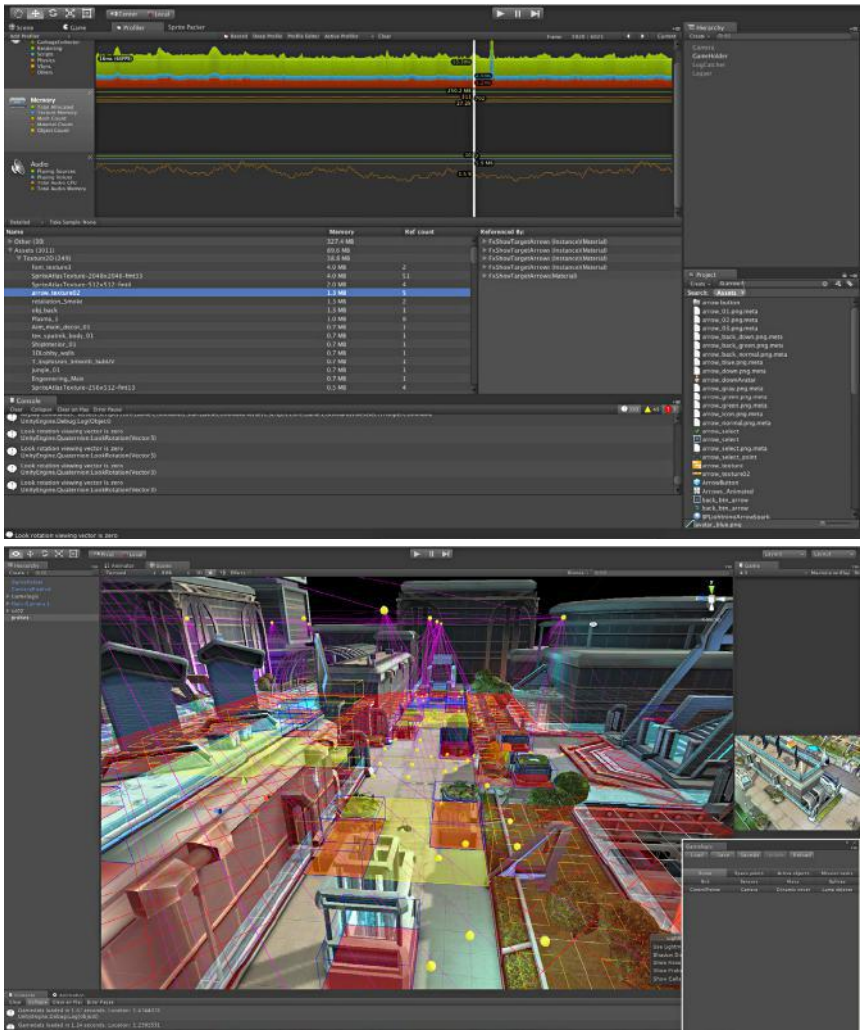
to maintain the version you are on, or update to the latest version of the technology, be it the core game engine or plugins you are using.

It takes a brilliant team to design a future proof architecture to make as little pivot points as possible. The best people with years of industry experience can see six, maybe nine, in certain cases twelve months ahead. With the development cycle of 18+ months you have to plan for pivots and technology depth sweeping. And this is our story.

Performance

We designed the title as iOS-first, but available for porting to other platforms, such as Windows Phone and Android. Initially we aimed for iPad 2 as a minimum device, but eventually we ran out of memory budget and decided to optimize for iPad 2 later on, if needed.

With Unity it was quite easy to build our early prototypes for Windows Phone and Android mobile devices, as a well for Mac and Windows



Memory usage and the overall performance of the game was a problem that the team was struggling with. Therefore the team analyzed their game indepth to improve performance.

desktops. This was a nice opportunity to catch bugs and issues at the early stage, to make iterations faster and to playtest under different circumstances. Obviously, as the game was deeper in development, and as we were happy with our prototyping results we focused more on the launch platform.

The game features a lot of animations, heavy assets that have to be kept in memory along with a set of memory-hungry subsystems like those for multiplayer and cutscenes. And this can grow under certain conditions. So while we kept ourselves on a diet, a 400 megabytes RAM footprint was what we ended up with. There were options of dumping some eye candy and implementing a quality fallback system to support a 512 megabytes device, yet we agreed on starting with iPad 3 or iPhone 5 as minimum supported devices instead. On the graphical side though, we are still fine with iPad 2 which we had targeted at.

It is a general truth that the more you can compute offline the better is real-time performance – batch static geometry, bake lights, precompute probes, etc. As our level geometry is mostly static, and we are in control of camera rotation, we went for the obvious solution of using lightmaps and light probes.

We are still on Unity 4.6 meaning we rely on Beast rather than Umbra solution found in Unity 5. Each battle scene features a pack of four to six single lightmaps with a size of 1,024 by 1,024 pixels. This is the setup that worked best with our use of light probes. We heavily rely on the latter, as the lightning on our levels is complex and characters move around the level. We hand tune the light probes, so nothing fancy here. Probably the takeaway is that scarce placement of light probes rendered a better looking and faster working picture, and with default dense placement we were often getting overlit objects.

All shaders in the game are custom-tailored. For most materials we just took built-in Unity mobile shaders and modified them accordingly or our needs, like the »x-ray shader for overlapping objects«. Then we programmed certain shaders to emit light through textures to function as light sources and removed all real-time lights from the battle levels.

Beautiful shadows were a must however. To compensate for an active directional light, we built a script that dictated direction and angle of the prebaked light, then a shader projected mesh on a plain and the resulted alpha got blended with a screen buffer in a fullscreen post effect.

The drawback: we could cast it only on the plain, but not onto the custom level geometry like stones, crates and walls. This is easily forgiven though and in most cases is not noticeable. So we have high-detail realistic shadows on pre-lit scenes.

Our rendering guys invested lots and lots of time on implementing proper fog of war, yet still we fallback to a very basic fog on low end devices. So we proved the theory of transparent objects being slow on mobiles. They definitely are even on the tile-based PowerVR GPUs found in iOS devices.

As the game grew with more and more different materials the built-in batching solution broke. This was fixed by a modified »combine meshes script« that was implemented in an own batching solution that suited our scenario with multiple dynamic objects on the scene. All

All shaders in the game are custom-tailored and light probes are manually placed and adjusted to achieve the visual fidelity the team wanted.

in all both static and dynamic batching solutions were adapted to the game needs.

We use Unity's Shuriken particle system for the particles. Our artists were able to achieve very beautiful effects with it, but those were too slow. We implemented particle pooling, optimized the way particles overlap and reduced the number of those.

The initial goal was a universal build working well on iPhones and iPads. However, we had more iPads than iPhones in the office, and so we tested more on the iPads. That eventually affected usability on smaller screens, something we had to crunch on last minute. And judging by the early feedback, player experience on smaller screen is great now. The turn-based strategy genre is probably more suited for an iPad, but players love playing games on the go. We have to respect players and offer the best possible experience on a five to six inch device even though the genre itself may demand a larger screen.

Art

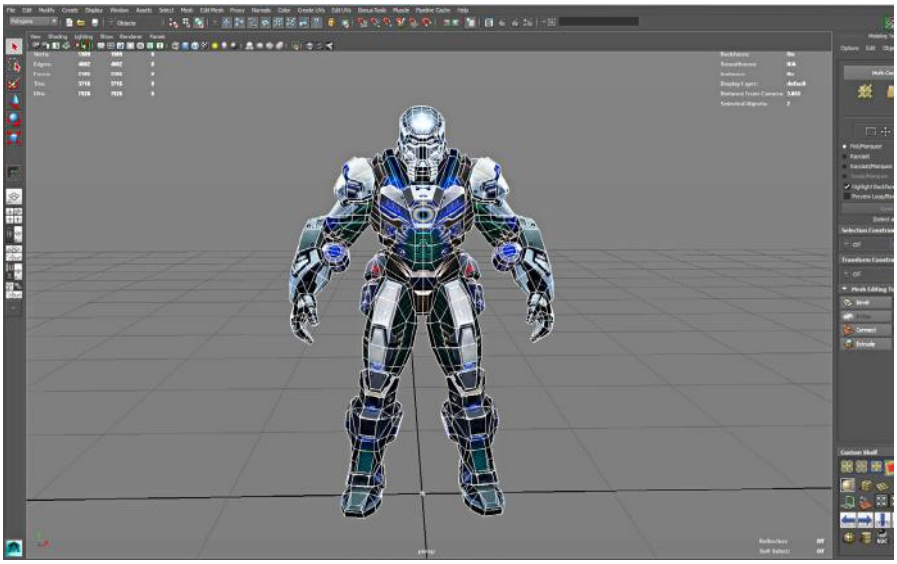
»X-Mercs« is a mobile game so our triangle and draw call budgets were limited. On the good point, turn-based games are quite predictable on what appears where, when and how, what does load, what does not, maybe gratefully steal player's attention to load something heavy in the background. This means a good team can aim for a better eye candy even on low end devices. This is exactly what we did: gorgeous pictures even on low end devices was something we initially looked for.

The game is 3D, and so in battle the player can rotate the camera, zoom in, zoom out. And we also wanted cinematic close-ups during the battle, so highly detailed characters and environment were a must. We ended up with 3,500 polygon characters, each with 30 to 40 bones, a single 1,024 texture for the body and a single 512 texture for the head. We textured characters on a rigged and finalized mesh to ensure the best possible zoomed-in looks.

Again, given the close-ups and the nature of the 3D turn-based strategy game, the battle had to look nice, or even very nice. So we made sure troops move, shoot, run, duck, recharge and well, die, using beautiful animations. In fact, we made about 130 different animations, different for male and female troopers, as they don't share skeletons. We believe this attention to detail is important, and by setting the quality bar this high we are fulfilling the ever growing player expectations.

And yes, all animations are hand tuned with next to no Mecanim use. For our next super ambitious projects, however, we are switching to Mecanim.

The lobby has little gameplay and is not sensitive to stuttering, a good reason for the artists to go wild. So as we decided to upgrade it out of a static meta-game screen to a full-fledged game experience, we went for the best possible eye candy. We designed high poly locations with cool main characters. While the looks of those have generated different opinions and ideas for improvement, we'll focus on the technical part here.



A typical character in the game is made of 3,500 polygons and has 30 to 40 bones to get animated. In terms of textures the team decided to go for a 1,024 texture for the body and a 512 texture for the head.

What you see is about 8,000 triangles, 90 bones and a single 2K-texture per lady. Each character has more than 20 different animations that are combined into cutscenes, what is a huge topic by itself.

Cutscenes

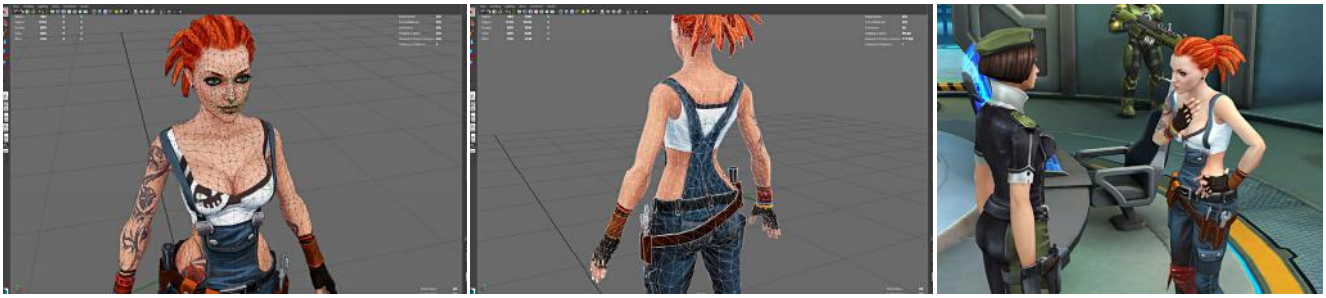
»X-Mercs« is a turn-based game made for a platform where short gaming sessions prevail. Meaning, players are used to ever-changing action and fast results, so we had to make 20 to 30 minutes lasting battles more entertaining while still appealing to the hardcore strategy games fans. And, cutscenes do the trick here.

Imagine that your turn-based battle every once in a while features an epic close-up of your favorite character doing a critical damage or shooting down a dangerous enemy. In short: scenes like this are good looking and do not disturb the gameplay. You'd love it!

Our full-fledged 3D lobby with beautiful high resolution characters and a base also got a reasonable share of cutscenes. In fact, it relies on cutscenes for the narrative and quests. For example, for the character Veronica alone we have 24 mini-cut scenes, with different camera movements, starts and endings that are mostly random, but hand tuned where applicable.

As we figured out we'll be doing lots of cutscenes, we went to Unity's Asset Store and evaluated a few tools but eventually ended up with an own solution built along Aperture Cutscene Editor. We record shorts with different cameras and various event triggers and then manage them with an external tool. For example, you can instantiate a character, fire required sequence of animations, invoke dialogue, script camera movement and more.

Our Free2Play market experience proves that frequent content updates are essential for a mobile games' success in the modern world. So we wanted to be able to ship new cutscenes



»X-Mercs« features a lot of cutscenes to keep the player engaged. Therefore the lobby characters are even more detailed and well-animated.

OTA along the new mission quests. And we found it was easier to create an external tool than use what we had available within the Unity Editor. And the goal was achieved: we are able to assemble cutscene scripts that include dialogs, camera animation, character events, and ship them to the game without updating the game's binary.

Pipeline

A game of our scale has a massive amount of content, lots of custom shaders, materials, animations. Given the extreme development cycle, a set of major design and art pivot points, multiplatform ambitions and a strong focus on content updates, we needed very strict rules and a kind of dictatorship regime on the pipeline. As the team was very technical, we chose Mercurial version control system and made tools to befriend it from within Unity. Then we picked a few most technical artists and designers, helped them master our tools and own the pipeline duties along the likeminded. So these few pretty much became pipeline gateways for their art and design departments.

We feel it is very important that all members of the team see their contribution to the whole project within the same environment, are able to tweak it themselves, play with the scene until it is perfect. It is crucial for a large production, that all those artists creating and polishing textures, meshes, the designers playing with levels and all other artsy and geeky people are able to function as a single reliable mechanism.

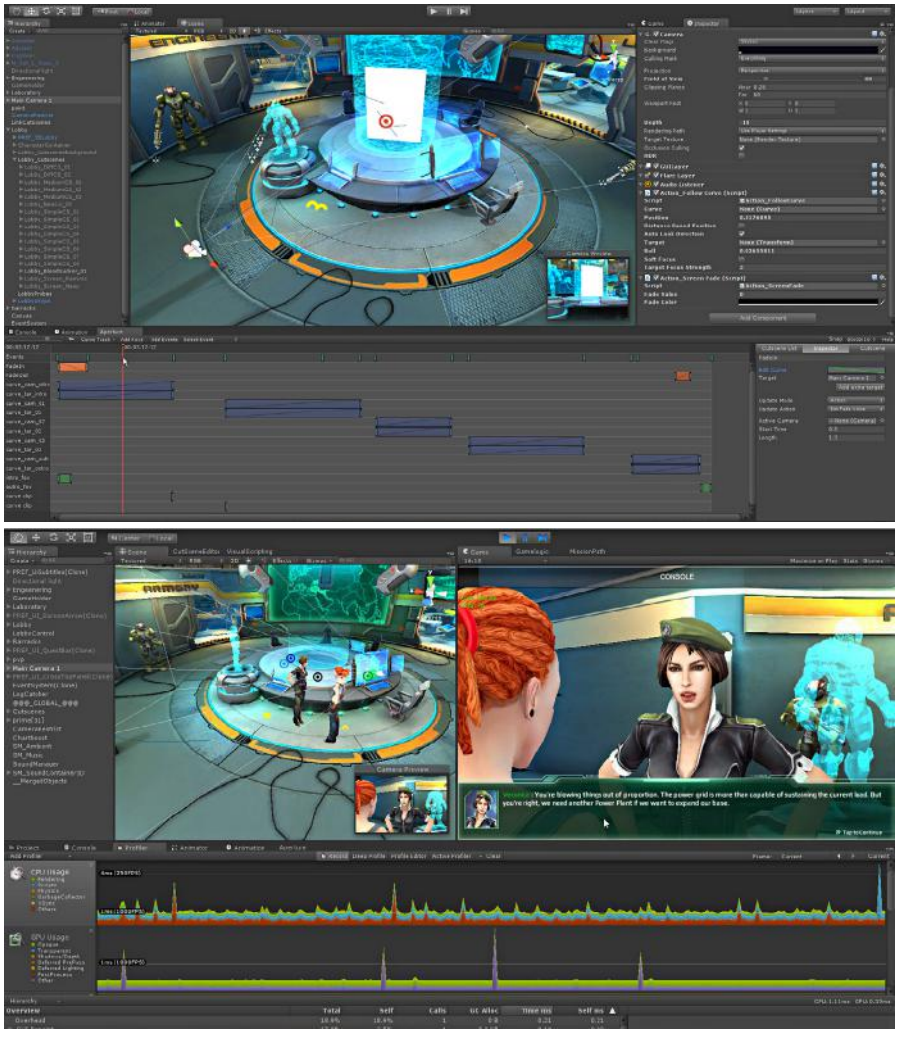
While we are proud that all our artsy people have been looking at the game through the same Unity editor window as the programmers, this required some work.

We found the Unity editor magnificently extensible and created a set of custom tools on top of the editor and the pipeline quickly. However, for an MMO game with an authoritative server, where each gameplay session relates on the progress from the last session, potentially a PvP one, our dev team had to invest additional time into the tools and networking tech. But we believe it was totally worth it.

Today one looking at the Unity editor with the »X-Mercs«-project deployed finds custom level design tools, impressive cutscenes tools, an interface for our own client-server technology, tools to manage the custom level serialization format and all that small automation scripts that improved the daily routine of artists, designers, producers, programmers, and testers.

We invested in automation tools for better testing and quality control. We scripted some of the common and routine tasks, such as the process of assembling assets in the scene as ready to go prefabs.

This whole custom system matured along the project: we started from the basics and added more features that we felt were improving our workflow. Unity editor scriptability allowed us to adjust the pipeline and set up the process according to the needs of the team and the project.



As cutscenes are very important for the team, they ended up using a special editor to script camera movement, invoke dialogue, etc.

It is important to note here that not only the custom tools require maintaining, they also may become obsolete as the project develops. Aging affects both homebrew tools and the plugins you adapt for custom needs. And normal workflow with Unity is that you have lots of this. So plan accordingly.

Game Design

Evolving the custom tools story, we ended up with a system that allowed game designers, level designers, artists and programmers work fairly independently, being able to focus on what they do best. So 3D artists did raw level mockups that were later transformed into polished levels by level artists and the latter were converted into actual missions by game designers.

What is known as a scene in Unity is called a »setting« within our game philosophy: like jungles, science lab, abandoned city, etc. We have 40 of such settings ready for the launch. They are not shipped with the game and are saved for the next step instead.

Each setting is a foundation for three to seven levels with unique designs, object distribution, buildings design and whatever level artists decide to do. We call that a level, and this is a Unity scene as well. And these level-scenes do ship with the game build.

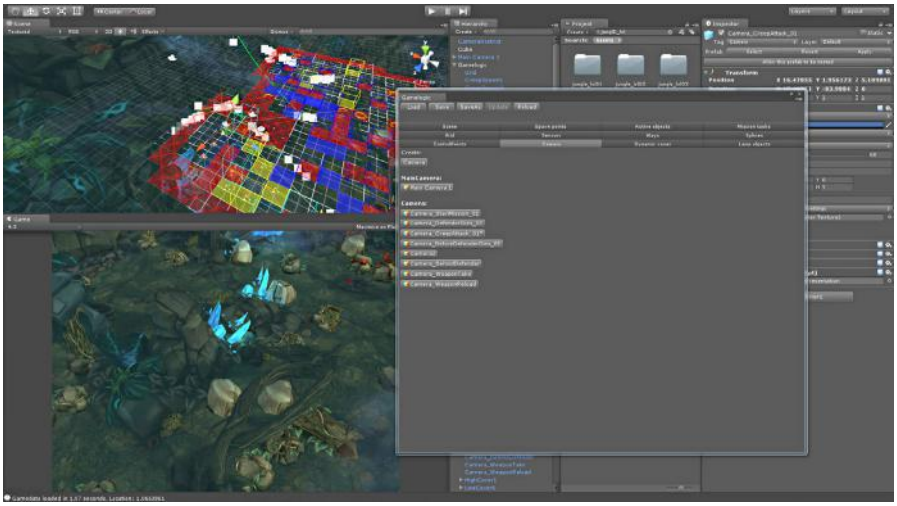
Each level itself is a base for a mission, with unique design of creeps' placement, mission goals (like save an NPC, survive for 10 turns, kill them all and more), bonuses and destroyables. About 250 of these missions are available in the game at launch.

Once the level Unity scene is loaded at a runtime, the corresponding JSON file with a mission gets loaded along it. The cool thing? Those mission files don't have any scripts, just data and can be downloaded OTA without re-downloading the game binary. In other words, we can ship new quests in small OTA updates, and we'll do it often to keep even the most active players happy with new content.

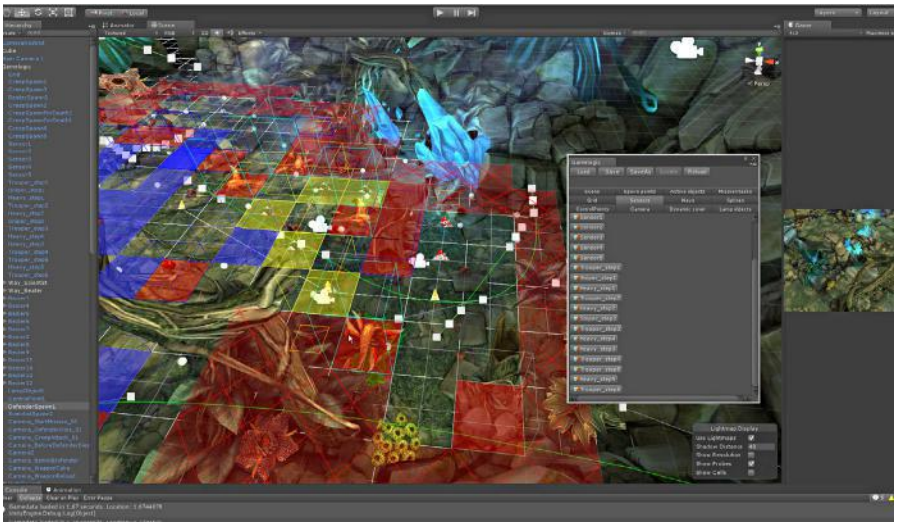
So as you play the game and are almost done with the mission and barely alive walk down the level to your carrier, and then a set of fresh enemies appear – blame level designers, it is them. The side quests, like find an artifact, destroy an object or get to a specific place on the map – this all is on the level designers' plate.

While Unity is not famous for awesome collaborative development environment for large teams, we made our way through by establishing a process where people normally don't work on the same Unity scene and don't simultaneously modify same scene assets and prefabs. 3D artists create environments and tweak their stuff on for the foundations. Then level artists assemble levels on the given foundations, and then level designers finish those as missions. And then there's a turn for render artists.

For performance reasons we don't have any real-time lights on the battle levels. Instead we modified shaders to emit light through textures, added light probes, light maps and a custom shadow solution. So the level has to be lit and relit each time the level design changes.



Unity editor can be adjusted to a team's needs by adding Editor scripts which made it easy for artists or designers to work with the game engine.



The team came up with a system to frequently update the game once it is released: new missions, quests and dialogues get pushed to the game bypassing the iOS store approval procress.

Again, all this process happens from within the Unity editor using our developed tools with custom Unity editor views resulting with the whole team seeing the game with same eyes and talking the same language. Like in this case level designers use a special tool to put quest events and design the gameplay on the particular scene.

Final words

We are grateful to Unity Technologies for all the support during all those years and especially supporting us with the last mile crunch. We are extremely proud of what we have managed to achieve with »X-Mercs«. We believe the game is fascinating from the technology and gameplay sides. It is one of the largest titles for mobiles and this is just the start. We are listening to the players, updating the game to their responses, adding more content, focusing on the PvP and community parts of the game. So yes, we have just started to amaze the industry. Stay tuned. **Oleg Pridiuk**

AN ANDROID GAME DEVELOPER'S SURVIVAL GUIDE TO CHINA

Asia and especially China are by far the biggest markets for mobile games, but it is not easy to monetize games there. The experts from Smartions give hints on how to approach releasing a game in China.

Two examples that use SinoMoGo to release and promote their games in China: »City Island 3« from Sparkling Society and »Death Colony: Apokalypse« from Awesome Industries.

As the Chinese mobile gaming market continues to grow, it's certainly not a market that can be ignored. This year the Android dominated Chinese mobile games market is on track to overtake the US and Japan as the world's largest mobile gaming market and revenue hit 9.96 billion Yuan (1.4 billion Euro) in Q1 2015, an increase of 75.3 percent from 2014 and a 22.3 percent increase from the previous quarter (source: iResearch, 2015). However, many see it as a market with rampant piracy.

There are a lot of false assumptions made by those on the outside of the market as they see Chinese players in their games but no money from China, and at the same time misinformation regarding the Chinese mobile gaming market is propagated by those who want to keep it »confusing« to the outsider.

Granted, China's mobile gaming market is subject to extreme fragmentation and trying to understand it can be a trip down the rabbit whole where things make less and less sense. It many ways it's chaos. However as the Chinese expression goes, »heroes are born in chaos« and there is plenty of opportunity in China's mobile ecosystem. We have had games that have outperformed the rest of the world combined in China alone with strong retention and conversion.

Having been involved in bringing foreign mobile games to the Chinese market for a number of years, we have learnt more than a few things; some through hard lessons, and some through pig-headed persistence.

China is a VERY Different Market

In China, there are over 300 Android app stores. Google Play, PayPal, Facebook, Twitter, YouTube and many other social and payment platforms that are common in the rest of the world have no presence in China or are blocked by the great firewall. This means your game will be cut off from Google services. Doesn't sound like a big deal at first, but it can be where a game is closely coupled with Play Games Services including social leaderboards, as well as Google Wallet, Cloud Messaging, and even Maps.

Android is King but Google is not

Despite Google services being blocked in China, Android is king and there are many custom Android ROMs from various manufacturers present in the domestic Chinese market such as Xiaomi, Huawei, Alibaba, Baidu, OPPO, Lenovo, etc. Android's market share in China is hard to measure. Many Chinese users have more than one phone or have dual SIM setup so things get a bit blurry here, but based on different data sources and our own analytics, we estimate Android's market share to be approximately 80 per cent. So if you want to see meaningful return from China, you need to be on Android.

Of course, there are intermittent rumours regarding Google Play being officially allowed to operate in China, and that would certainly make things interesting but the Chinese government have not been fans of that idea to date. Even if Google Play was to be unblocked in China, there are many local market incumbents that would not like to relinquish what market share they have and it would be no easy road for Google. Whilst individually none of the local China android app stores has anything comparable to the market share Google has outside China, Chinese smartphone users are used to an ecosystem where they may have five or more of their preferred App store marketplace apps installed on their phone.

300+ App Stores but Google ain't one

With so many local app stores, some of which are owned by larger entities with broader interests (e.g. Baidu, Alibaba, etc.), there is a lot of interstore politics to content with. Developers are often stuck in the middle of a turf war between stores which results in »policy« changes that can cause additional headaches if you are not prepared for them. An example was where one of the larger app stores launched its own analytics solution and from one day to the other and announced that they would no longer accept games or apps with Baidu mobile analytics integrated. A little inconvenience given that Baidu's solution is one of the most commonly used analytics solutions in China.

Releasing to a single app store is not an option unless you have an incredibly strong and established brand or IP that will draw players to that store despite them not having the stores' marketplace app installed on their phone as one of their preferred stores. Any single store lacks the reach to address the broader market despite claims to the contrary. Even when you are dealing with an app store directly, you probably won't be dealing with a single point of contact. The business development manager who is typically your first contact will have some level of English, those in operations and development support most probably won't (in China less than one per cent of the population speaks English but many more can read English). So it is best to have a partner or publisher who will handle app store mediation at all levels.

It's not the Asian Market, it's the Chinese Market

Some lump China into »Asia« when speaking about the mobile markets in the Far East. Geographically and culturally indisputable, but it is very important to understand that China is extremely different to Japan or South Korea where Google Play still matters. Fragmentation is significant and one needs to be prepared for the impact organizationally and technically. This is why it is important to work with a partner in China who can guide you through the confusion, mediate with the different app store channels in China and provide a technical solution that ensures your development team don't have to spend their days (or rather weeks and months) integrating with a bunch of poorly documented app store, social, and ad SDKs or attempting to satisfy a multitude of different store restrictions in terms of third-party integrations and maximum APK size (most stores have a 100 megabytes APK limit).

Your Game may Already be in China

Many question how it can be that if Google is blocked in China why they see so many downloads of their game in China. The answer is simple, a number of stores in China will pull your game's APK from Google Play automatically. Which would be great but it also means payments won't work so Chinese users cannot pay for items in your game. Sharing won't work if it depends on Facebook or Twitter, etc. Additional download content won't be accessible and if you haven't dealt with localization to simplified Chinese, then based on the overall package, users in China may be saying unflattering things about your game without you even being aware that it was available to them.

Free2Play is the Only Model for China

Free2Play is the only model that works in China. Stores do not support a paid download model.

A nasty surprise for those not using a F2P model is that where you have a free and paid version of your game, both are often pulled by certain China app stores from Google Play and made available for free in China. So for those who are against a Free2Play model, fair enough, but you may just have killed your chances of monetizing in a market the can be equal to the rest of the world combined. This is why as part of any release plan we recommend you give serious consideration to China from the outset. Free2Play is the only model that can effectively monetize in China and enables greater control of content to keep you ahead of the pirates.

Monetizing Players without Google

Whilst Google Wallet isn't an option for Chinese users, there are independent mobile billing (Alipay, UnionPay, etc.) and carrier billing (China Mobile, Telecom, and Unicom) alternatives.

It can be difficult to access these payment solutions in any useful way without a partner billing solution that opens up all methods to the end-user. Carrier billing will be impossible to get to without having a Chinese business entity in the mix. So don't waste time trying to get to and build a self-developed solution.

Although the fees are higher (usually 30 percent on any transaction) carrier billing is important and SMS payments offers greater conversion to paying players through convince. Nonetheless, insisting on carrier billing from the outset can be a mistake. App stores only take a cut on carrier billing where a carrier channel build is provided, and the carriers themselves can be useful allies when promoting your game where it is already monetizing well in-market, but both independent and carrier operated app stores have minimum expectations in terms of daily revenues. Switching on carrier billing from first launch means they will know exactly how your game performs from day one, and if early earnings do not reach their benchmark, then they may dismiss your game as ever being worthy of promotion. With the carriers and stores you don't get a second chance.

Unless your game is a massive IP that players in China have been eagerly awaiting, carrier billing should only be enabled after an initial stealth launch in China with only independent billing options enabled, then when KPIs have been analyzed and any necessary steps have

Patrick Wheeler
is Founder & CEO
of Smartions AG.

Patrick is CEO and Co-founder at Smartions AG and brings with him 18 years' international work experience in the software development, gaming, and localization industries. Formerly CTO at a China focused tech startup and Head of Release & Localization at Aeria Games, Patrick has a strong background running large-scale development and game release projects and teams as well as the practical application of in-country social and user acquisition strategies. Working with China for many years in different roles, Patrick is very familiar with the Chinese mobile landscape and larger macro environment.

Rajmund Balogh
is Founder & CTO
of Smartions AG.

Co-founder and CTO at Smartions AG, Rajmund has a 17 years' background in IT as a Platform Architect, Network Administrator, QA Manager and all-round tech guru. Having worked internationally in both large multinationals and startups alike, Rajmund brings with him a deep knowledge of infrastructure, virtualization, and complex server setups as well as experience in scoping, planning, and implementing large scale cross-media platforms in China.

Hong Thieu
is Founder & CFO
of Smartions AG.

Co-founder and CFO at Smartions AG, Hong Thieu brings more than 16 years of experience in corporate finance and corporate development to the founder team. Prior joining Smartions Europe Hong served as CFO in several German VC funded companies and oversaw two successful IPOs. As Vice President of a listed company for corporate affairs, he has been responsible for corporate legal, governance, and investor relations. In addition to this, Hong's background as Investment Director of a family office, co-founder, and Business Angel for several startups mean that Hong is not only familiar with the structuring and syndicating of funding rounds but knows the essential ingredients of great tech startup.

Fang Liang
is CEO
of Smartions China.

As Computer Science Graduate of Griffith College Dublin and a hardcore gamer, Fang has many years of development expertise working internationally with multinationals such as Microsoft and Sage Technologies as well as helping smaller businesses develop and grow in the Chinese market. Returning to China in 2010, Fang founded his own mobile development company and his focus in recent years has turned towards serving the West to East mobile gaming channel.

Chinese gamers are mainly using Android devices but at the same time can't use Google services or social networks like Facebook. Instead developers should plan with Chinese services in mind.

About Smartions AG

SinoMoGo ™ is a platform for mobile game developers to launch their games in China. With offices in Berlin (Germany) and Suzhou (China) and an experienced team with deep knowledge of the Chinese gaming market, Smartions enables foreign mobile game developers to monetize their games in the Chinese market by offering a one-stop-solution for the technical adaptation, localization, promotion, distribution and operation of western games in China via their SinoMoGo platform and SDK.

The SinoMoGo platform has been live since July 2014 and is the first scalable solution to offer China Android App Distribution as a Service to game developers outside China, enabling gaming companies from around the world to effectively target China's massive mobile market without the need to hand over a single line of source-code to an external party.

The SinoMoGo SDK provides Android game and app developers with simple access to end-user billing via popular Chinese payment services, in-app social connectivity across major local social networks, and deep analytics.

To see how Smartions and SinoMoGo can help you monetize in China's vast yet fragmented mobile market, talk to them at Gamescom 2015.

been taken to optimize retention and conversion, carrier billing can be enabled.

To ensure greater conversion, price points of virtual currency packs and other purchasable items will need to be calibrated to Chinese norms. Having a lower entry-level pricing is common but this depends on the quality of the title. Entry pricing for In-App Purchases is usually between 2 (0.30 Euros) and 10 Yuan (1.50 Euros). In some ways it's better to start your stealth launch with slightly higher pricing so reductions are possible at a later point. Virtual currency pack pricing should also be modelled with carrier billing limits for individual transactions in mind (depending on the carrier limits can be in the 3 to 7 Euros range). In the end you will need to heed the recommendations of your China partner.

Time to Market is Key

When your game has been in-market for some time »unofficially« before you start to consider China, poor player feedback due to broken billing and social integration, no localized version, and general issues can mean you already inherit a bad store rating before you even consider officially launching your game in China. The larger the delta between your release outside of China and your official China release, the more control you lose, the more your brand can be impacted, and the harder it can become to get promotion for what may be considered an »old« IP.

This sounds like a no-win scenario. That's not the case, but to ensure your game is positioned for success in China, make China part of your release plans from the outset. Make sure you learn from early feedback and adapt quickly, don't spend six to twelve months adapting a title for China with a partner without knowing if you will see return. The only true learnings are to be found in-market but a stealth launch approach is more often the better approach. Sometimes it makes sense to look at your back catalogue of games and test the waters with an older title and see what can be learnt before launching for the first time in China with your flagship game.

Monetizing via Ads – The »Catch-22«

Whilst F2P is the model that works best for China, there is a place for ads and the fact that some Chinese stores pull APKs from Google Play means you may see some revenue from ads in China already. However, many western ad networks have no points of presence in China or have difficulty serving ads. Furthermore, driving ad traffic from China to Google Play is like driving a truck into a wall. Chinese users are cut off from Google Play and therefore this represents a bad deal for those on the other end paying on a CPC basis for ads that are served in China but where traffic is directed to Google Play. Fortunately other types of ad inventory such as brand ads present far less of an issue.

When officially publishing your Android game in China, bizarre things start to happen when you have ads in your game. Your game may already exist on some of the larger stores as it was pulled from Google Play, but when you go to officially publish, you may be told that ads are not allowed under the store »policy«. This can be very frustrating when you see that your game was already taken by the store in question without permission. The choices are rage against the machine or deal with it.

Maybe you think that having ads present but disabled is the way to go, later enabling them when the game is live on stores. Unfortunately, games being officially published are subject to both manual and automated review. Meaning your APK will be scanned and if any third party SDK components are detected that are on the blacklist, then your submission fails.

Dealing with this means accepting that you may will have to have an ad-enabled and ad-free version of your game to satisfy all channels. If your game's only revenue stream is via ad display, then working with an ad network that has experience in China is a must as app store distribution channels will be more limited but working with the right partner can ensure you have good reach across channels which do not reject ad-enabled games.

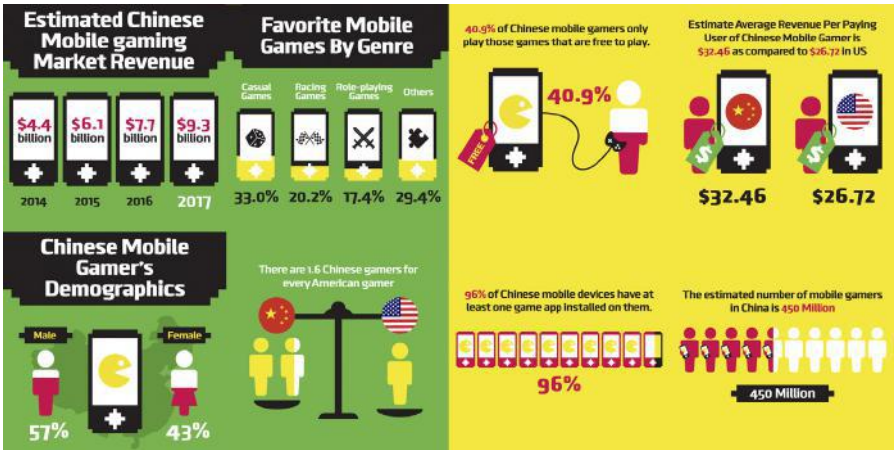
Don't Expect anyone to buy the Game

Don't expect for anyone to buy your game outright. Sure, some stores and publishers will offer minimum guarantee for your game if it is of a certain caliber, meaning AAA. Be realistic about your IP, it may make nice money but Chinese app store expectations for healthy daily revenues are a lot higher than you may expect.

Whilst cultural tendencies may mean a store business development manager in China will say positive things about your game, don't mistake this for »they want to buy my game«. So if your game isn't the in the current top-earning game list, don't approach such negotiations with a »My game is awesome, what are you going to do for me?«-attitude as you will probably come away with nothing and have wasted time with negotiations that seem to take as many steps backwards as forwards.

Where an offer and draft agreement is on the table, be diligent in reviewing licensing details to be fully aware what you are giving up and understand the long term implications; the other party will probably be looking for ownership of all source code and assets, so attention should be paid to any clauses with regards to ongoing revenue share split on clones built from the same code and assets. Also be aware that any agreement made directly with a solely China based publisher concerning publishing in China will be governed under Chinese law regardless of the jurisdiction you specify in your contract and rulings by courts outside of China are not enforceable in China. So it's better to work with a partner who has interests outside of China as well or where the agreement is not directly / solely with the Chinese entity.

Just because your game is not the top-earning game, it doesn't mean it won't make money in China, but the approach needs to fit the IP and you have to understand that the Chinese partner you select has to deal with a massive amount of complexity, fragmentation, approvals, licenses, and channel mediation on your behalf. That's why in the majority of cases it's better to be more pragmatic about getting your game to market quicker, controlling your brand and IP in market, and learning. The longer you take to get to market, the more players your game may already be churning in China as the shelf-life of your game diminishes.



A recent study on the Chinese mobile games market by researchers from Go-globe. See all results at: www.go-globe.com/blog/mobile-gaming-china

Social Discovery & Visibility Matters

There is also a lot of innovation coming out of the Chinese mobile space and this is particularly evident in the social realm where WeChat (Weixin) and others offer arguably more sophisticated social platforms than those in the West.

This is an important factor when launching a game in China as more and more Chinese players are finding games via social discovery whereas in contrast a number of the major app stores have reduced their download forecasts across all promotional placement slots when compared to previous years and are quite socially »detached« or are trying to build their own walled garden ecosystems.

The effective use of social channels such as WeChat, Sina Weibo, Tencent Qzone, etc. will continue to be of increasing importance when it comes to promoting your game in China and we have seen promotion via Key Opinion Leaders (KOLs) gain more installs than significant front page app store promotions when campaigns are properly planned out.

The significance of social promotion and discovery cannot be understated in a market where other forms of promotion are largely dependent on negotiating banner promotions with often fickle app stores and where performance marketing falls on its face when confronted with both app store and payment provider fragmentation and politics.

In-game integration with Chinese social networks is vital to the continued visibility and growth of your game and Chinese players tend to share a lot more than their western counterparts, particularly where sharing is well implemented and incentivized. Of course social media in China is subject to regulation so once again this is an area where you should take guidance from your China partner.

Localization & Cultural Adaption

Quality localization of your game to Chinese is a must. »Cultural adaption«, »Culturalization« or »Transcreation« is something often oversold and quite intangible depending on the game. In an RPG it will be of more importance than in a basic pattern matching puzzle game.

It is important to adapt your game for China, including the pricing model, difficulty (which tends to need to be increased for China) and also address any issues with violent or adult content, but don't overthink »cultural adaption« trying to second-guess your Chinese audiences likes and dislikes. Instead keep in mind that the best feedback is real player feedback – don't rip your game's soul out during the course of adapting it for the Chinese market.

Keeping your Sanity and Making Money in China

In case the message wasn't clear, when it comes to China don't go there alone. We've heard many times that people think they can take a DIY approach and don't need a partner because they already have several millions of downloads in China. In pretty much all these cases when we ask if they make any money from China, the response is along the lines of, »no, but it's all piracy anyway«. This is a massive simplification of an extremely complex market.

Chinese players DO pay for games where the game is good, the business model is right, and where they CAN pay. Often ARPPU and conversion is higher than outside of China. Piracy will always exist and of course it is more of a factor in a fragmented market such as the Chinese mobile market, but to a large extent this can be managed if you have a good partner in-country looking after your interests.

The Chinese mobile market is far from simple and cannot be navigated successfully alone, the content of this article is pretty high-level but when you are seeking for a Chinese partner or publisher, discussing the topics raised in this article should be a good test of how well they really know the market.

As with everywhere else in the world or life there is no guarantee of success in China but if you've gone to the effort of developing your game, ignoring China can potentially mean leaving a very large chunk of money on the table. China certainly can be a land of opportunity if your approach is right. So whatever path you chose, don't treat China as an afterthought and make sure you have a partner who can position your game for success.

Patrick Wheeler, Rajmund Balogh, Hong Thieu

The SinoMoGo solution provides a platform and SDK to enable developers to monetize China as well as in-country operational and promotional services.

INDIE GOES ESPORT
KLEINES TEAM, GROSSE ZIELE

Vom Studentenprojekt zum Free2Play-eSport-Titel. Das klingt verrückt, funktioniert mit Beratern und Kooperationen aber gut, wie Gametology mit »Hover Cubes X« zeigt.

Christian Flock
ist CCO
von Gametology.

Christian hat zuvor bei Ubisoft Blue Byte als Level und VFX Artist gearbeitet. Nun ist er CCO von Gametology und nimmt sich zahlreicher Tätigkeiten sowie Entscheidungen rund um die kreative Gestaltung des Spiels an.

Philipp Sauer
ist CEO
von Gametology.

Philipp ist der CEO von Gametology und übernimmt dementsprechend alle ausführenden Tätigkeiten eines Geschäftsführers. Allerdings ist er, wie es bei kleineren Entwicklerstudios oft der Fall ist, auch für Arbeiten in anderen Bereichen zuständig. Als Game Designer ist er maßgeblich an der Gestaltung des Spiels und der Entwicklung neuer Spielinhalte beteiligt.

Wir haben Gametology Anfang 2014 aus dem Studium heraus gegründet, um auf den Grundlagen unseres einstigen Prototyps, an dem wir mit ein paar anderen Mitstudenten gearbeitet hatten, aufzubauen. Die ursprüngliche Version von »Hover Cubes«, so hieß unser Spiel während des Studiums noch, umfasste einige, damals schon von Prof. Dr. Linda Breitlauch als sehr innovativ betitelte, Features und bot die ideale Grundlage für eine Weiterentwicklung.

Anfangs war das Spiel noch als »Portal«-ähnlicher First-Person-Singleplayer-Puzzle-Shooter angedacht, bei dem sich der Spieler mithilfe unterschiedlicher Cubes, die er mit einer speziellen Waffe platzieren und wieder einsammeln konnte, den Weg durch alte Ruinen und vorbei an gefährlichen Hindernissen bahnen musste.

Allerdings änderte sich einiges, als wir beschlossen, uns mit einem Teil des Teams selbstständig zu machen und die Entwicklung von »Hover Cubes« auf professioneller Ebene voranzutreiben. Bis es so weit war, dass wir eine Zusammenarbeit mit Deck13 eingehen konnten und unser Traum immer mehr an Gestalt annehmen konnte, verging allerdings noch mal eine lange Zeit voller Höhen und Tiefen.

Nennt mir Euren Namen

Wie bereits erwähnt, gründeten wir Gametology Anfang 2014, um genauer zu sein am 27. Januar, mit insgesamt vier Leuten und stürzten uns Hals über Kopf in die Arbeit. Und natürlich begannen wir mit den allerwichtigsten Dingen zuerst: Name und Logo für das Studio. Nach langen Nächten, Diskussionen und Abstimmungen einigten wir uns auf das aktuelle Logo und ebenfalls den Namen – Gametology.

Mit neuem Namen und frischem Elan ging es nun darum, die Zukunft vom bisherigen Studentenprojekt vorzubereiten. Dazu gehörten unter anderem die Überlegungen, wohin die große Reise gehen sollte, aber natürlich auch die Abwägung, was letzten Endes für uns umsetzbar wäre und was nicht.

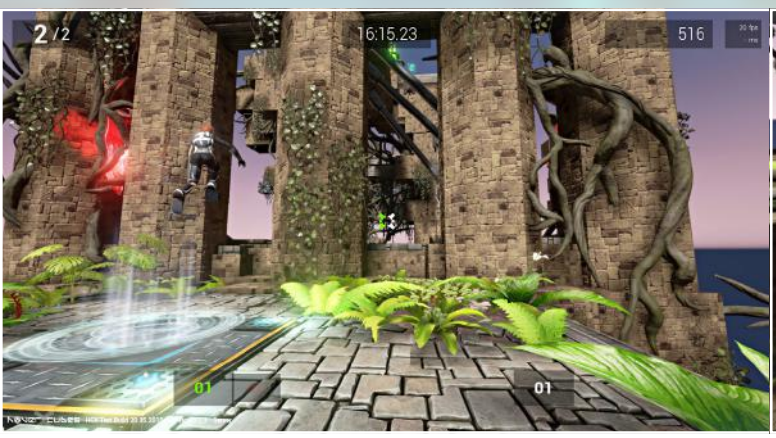
Von diversen eSport-Titeln inspiriert, sowie motiviert, aber auch darüber bewusst, dass es schwer werden könnte – und nach einigen prototypischen Abwandlungen vom Studentenprojekt –, war es letztendlich offensichtlich, in welche Richtung es gehen sollte.

Die Würfel sind gefallen (Design und Mechaniken)

Schnell war klar, dass wir das Projekt zu einem Multiplayer-Titel ausbauen wollten. Anstatt jedoch auf die bisherigen Rätsel zu setzen, sollte das Spielgeschehen dynamischer, schneller und einfacher verständlich werden, um einem eSport-Titel gerecht zu werden.

Die Spieler sollen somit in einem olympisch angehauchten Wettkampf in Parcours-Manier gegeneinander oder auch miteinander antreten und in diversen Disziplinen Fallen sowie Hindernisse überwinden. Gewinner von Punkten und Medaillen soll je nach Spielmodus derjenige sein, der es als Erster ins Ziel schafft oder als Letzter übrig bleibt.

Durch das systematische Einsetzen der verschiedenartigen Eigenschaften der fünf zur Verfügung stehenden Projektile, die nun über Handschuhe abgefeuert werden können, ist es



Aus dem ursprünglich als »Portal«-ähnlichen Rätsel-Shooter konzipierten Spiel wurde ein auf eSport ausgelegtes Free2Play-Spiel, das im September über Steam Early Access erscheinen soll.

Den Spielern sollen verschiedene Fähigkeiten zur Verfügung stehen, um taktisch vorgehen zu können. »Bridge« etwa spannt eine Brücke aus Hologrammen auf. So lassen sich größere Distanzen überwinden.

den Spielern möglich, auf unterschiedlichste Art und Weise ihr Können unter Beweis zu stellen.

Spielmodi wie Langstreckenlauf oder Arenakampf erlauben es den Teilnehmern, sich einzeln oder gar im Team in den Disziplinen zu messen, actiongeladene Wettkämpfe zu bestreiten, Punkte für sich und ihre Fraktion zu sammeln und somit die Weltrangliste emporzuklimmen.

Denn jeder Teilnehmer tritt für eine der vier Fraktionen an, die aufgrund vergangener epischer Geschehnisse den Wettkampf begründet haben, um nun um Ruhm und Ehre zu kämpfen. Kleine und große Turniere – ingame und live – sollen rund um »Hover Cubes X« veranstaltet werden, sodass das Gefühl von Olympia und eben diesen Fraktionen auch außerhalb des Spiels für die Spieler aufkommt.

Der Fokus des Gameplays liegt hierbei nun vielmehr auf leichtfüßigen Parcours-Elementen, wie etwa bei »Mirror's Edge«, um viele Bewegungsmöglichkeiten anzubieten und einen Grundstein für die geplante Dynamik zu legen. Mit den fünf erwähnten Projektilen bleiben jedoch auch die Cubes noch ein sehr wichtiger Bestandteil des Gameplays.

Deren verschiedene Funktionen werden es den Wettkampfteilnehmern, wie im ursprünglichen Prototyp, weiterhin ermöglichen, sich Wege auf ebenso unterschiedlichste Art und Weise zu bahnen. So erlaubt es zum Beispiel die Fähigkeit »Bridge«, eine Brücke aus Hologrammen aufzuspannen, um größere Distanzen zu überwinden, als es sogar mit einem Doppelsprung möglich wäre. Für hektischere Momente und höhere Vorsprünge hingegen ist der »Jelly« geeignet, der die Sprunghöhe ungemein steigert und einem Trampolin gleicht.

Mit der Zeit entwickelten sich stetig neue Ideen, die auch nach allgemeinem Zuspruch im Team schnell Einzug ins Spiel fanden und etwa die für die Cubes genutzten Projektile um neue Funktionen erweiterten. Schaltermechaniken, Buffs, Debuffs und Orbs sind nur einige der geplanten Features, die bereits umgesetzt werden konnten. Gerade im Arena-Turnier werden die Spieler voll auf ihre Kosten kommen, wenn sie gegnerischen Projektilen ausweichen müssen und gleichzeitig deren Schützen ein eigenes Projektil entgegenfeuern, das sie von der einst für standfest befundenen Plattform stößt. Zum selben Zeitpunkt könnten zwei weitere Spieler versuchen, sich den Weg auf hoch oben gelegene Plattformen zu bahnen, während sie Orbs – Bonusobjekte mit besonderen Funktionen – einsammeln und somit etwa die Sicht gegnerischer Spieler im Umkreis der Orbs erschweren … auf dass sie abstürzen und beim letzten Checkpoint wieder auftauchen.

In einer Übersicht am Ende des Spiels können dann solche Aktionen statistisch begutachtet werden, um für kommende Wettkämpfe gegebenenfalls eine neue Taktik auszutüfteln. Auch zahlreiche weitere Elemente finden auf diese Weise Einzug in das User Interface des Spiels.

Besonders die Lounge, die als Ingame-Menü dient und in der sich die Spieler abseits der Wettkämpfe aufhalten, wird mit wichtigen Informationen direkt in der 3D-Umgebung bestückt. Statistiken, Ranglisten und Monitore, über die derzeit aktive Wettkämpfe zwischen anderen Spielern zu sehen sind, stellen nur einige der Funktionen dar, die in der Lounge genutzt werden können.

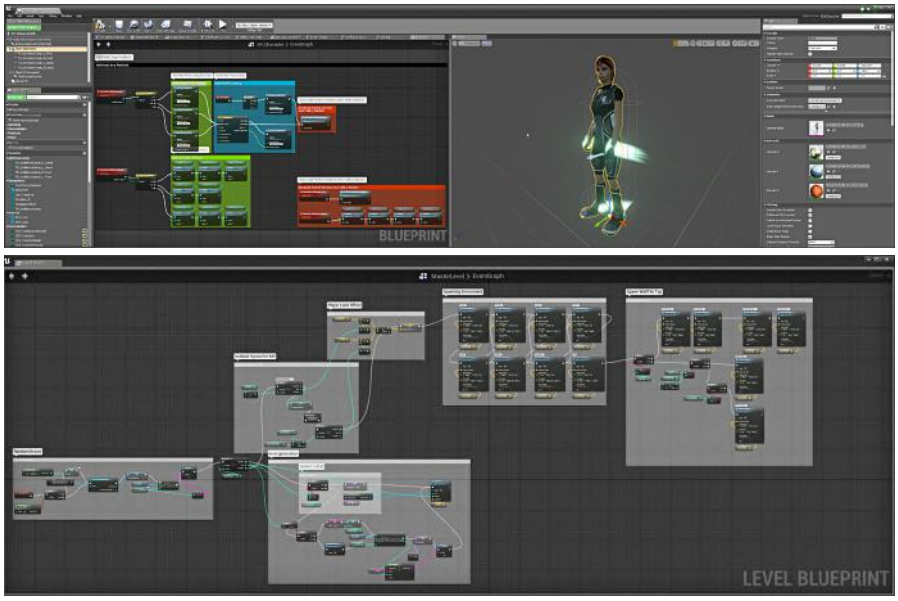
Easy to Learn – Hard to Master (Arbeit mit der UE)

Schon beim Erstellen der ersten Prototypen haben wir mit dem Unreal Development Kit gearbeitet und unsere Erfahrungen damit gemacht. Wir stießen allerdings immer wieder an Grenzen, die wir nur schwer umgehen konnten. So machte uns unter anderem das Belichtungssystem des UDK immer wieder das Leben schwer und hemmte uns an entscheidenden Stellen.

In einer Nacht-und-Nebel-Aktion also, bei der die Wirren der Gamescom 2014 genutzt wurden, haben unsere Programmierer die Grundlagen des bisherigen Projekts in die neue Unreal Engine 4 übertragen.

Eine weitere Fähigkeit, die sich Gametology ausgedacht hat, nennt sich »Jelly«, welche die Sprunghöhe des Charakters steigert und einem Trampolin gleicht.

Das mit der UE4 neu eingefügte Blueprint-System begeisterte uns von vornherein und ermöglicht uns, ohne viel Aufwand Gameplay-relevante Features zu testen, anzupassen und zu verbessern. So lässt sich die Arbeit in zahlreiche kleine Bereiche aufteilen. Netzwerkspezifische Programmierung und Kernelemente wie Charakter, Cubes oder UI-Grundlagen können in C++ erstellt werden. Gameplay sowie alle damit einhergehenden Mechanismen, die zugleich auch stark mit dem Design des Spiels verbunden sind, aber vor allem grafische Elemente des Spiels können angenehm im Editor der Engine angelegt und in den Blueprints verwertet und mit Leben gefüllt werden.



Das Blueprint-System der Unreal Engine ermöglicht es, ohne viel Aufwand neue Features zu testen, anzupassen und zu verbessern.

Durch diese Aufteilung ist ein fast reibungsloser Ablauf in der Planung, Entwicklung und Finalisierung von Features möglich. Allerdings nur »fast«, weil man bei der Größe und Vision eines solchen Projekts doch immer wieder an die Grenzen der Engine stößt. War es zuvor beim UDK das Licht, das uns zu schaffen machte, so sind es nun die eigenen Bedürfnisse an den Funktionsumfang der Engine. Denn gerade in den Bereichen Netzwerk und User Interface ist die Engine noch recht jungfräulich zugange. Aufgrund unserer Ambitionen können in diesen speziellen Gebieten jedoch leider keine Kompromisse eingegangen werden. Dadurch wiederum muss teilweise in den Tiefen des Engine-Codes gearbeitet werden, was man sich als Indie-Entwickler mit geringer Manpower im Idealfall versucht zu ersparen. Doch dank unserer jungen, aber dennoch schon sehr erfahrenen Teammitglieder sind dies momentan nur zeitliche Hürden, die es zu bewältigen gilt. Und wie man so schön weiß, fordert Innovation auch seinen Tribut.

Weil »Hover Cubes X« als Free2Play-Titel konzipiert ist, sollen die Spieler später für kosmetische Gegenstände bezahlen können. Außerdem plant Gametology, dass auf Ingame-Monitoren Werbung geschaltet werden kann.

Trotz dieser kleinen Hindernisse erzielen wir im großen Ganzen durchweg stetige Fortschritte, lernen die Unreal Engine 4 immer mehr zu verstehen und verfeinern unsere Arbeitsweise mit der gewählten Versionsverwaltung Perforce. Der Zugang zu BizSpark und Azure erlaubt uns zudem, die Services von Microsoft zu nutzen und somit neben der Entwicklungsumgebung Visual Studio vor allem auf die Serverleistungen zuzugreifen, mithilfe derer wir unseren ersten Dedicated Server betreiben wollen.

Ab September soll »Hover Cubes X« dann via Steam als Early-Access-Titel verfügbar sein. Bis dahin ist es jedoch noch eine Menge zielstrebiger Arbeit, die wir gern investieren, um unsere Vision zu verwirklichen. Und um die nächsten Pläne im Rahmen des Projekts finanzieren zu können und es auch nach Veröffentlichung weiterhin mit Spielinhalten zu versorgen.

Die Kunst geht nach Brot – oder auch nicht (Finanzierung)

Bisher haben wir die komplette Entwicklung von »Hover Cubes X« aus eigener Tasche finanziert. Dass das mehr ein notwendiges Übel als eine freiwillige Entscheidung war, sollte wohl jedem klar sein. Aber dank der finanziellen Unabhängigkeit hatten wir stets volle Kontrolle über das Projekt an sich und konnten es uns erlauben, die ein oder andere Sache anzugehen, die sonst so eventuell gar nicht in den Projektplan gepasst hätte.

Damit die Entwicklung auch nach Release des Spiels fortgesetzt werden kann beziehungsweise die gesamte Entwicklung keine finanzielle Katastrophe für uns wird, haben wir mehrere Ansätze, denen wir folgen werden, um das benötigte Geld in unsere Kassen zu spielen.

Weil »Hover Cubes X« an sich ein Free2Play-Titel sein wird, können wir nicht hoffen, aus dem Gewinn des Verkaufs schöpfen zu können. Wie für Free2Play-Titel typisch, binden wir einen passenden Ingame-Shop ins Spiel ein, in dem sich die Spieler dann sowohl für im Spiel erhaltene Währung als auch für besondere Währung, die mit Echtgeld aufgeladen werden kann, neue »Gegenstände« kaufen können.

Bei diesen »Gegenständen« handelt es sich um eine breit gefächerte Palette an Dingen, mit denen die Spieler ihre Spielcharaktere individualisieren können. Ganz klassisch wird es möglich sein, seinen Anzug farblich umzugestalten und anzupassen. Es wird keinerlei Optionen geben, sich einen Vorteil im Spiel zu erkaufen, weil wir besonderen Wert auf sportliche Fairness legen und diese nicht durch Ansätze von Pay2Win ins Straucheln bringen wollen.

Weiterhin wollen wir interessierten und zum Setting passenden Firmen die Möglichkeit bieten, über gut platzierte und in die Welt eingebundene Werbung effektiv auf ihre Produkte aufmerksam zu machen. Denkbar sind hier zum Beispiel Werbespots auf großen und bereits im Spiel vorhandenen Monitoren. Ebenfalls das direkte Sponsoring von erfolgreichen Teams durch externe Firmen und die damit verbundene Darstellung der Logos auf

den Anzügen der Charaktere, auf Bannern oder auf Ankündigungen sind denkbar.

Alle Mann an Deck! (Marketing)

Marketing ist eine der wichtigsten, wenn nicht sogar die wichtigste Sache, die von Indies leider häufig vernachlässigt wird. Oft auch schlichtweg aufgrund mangelnder Ressourcen, falscher Scheu beziehungsweise Bescheidenheit und fehlender Kontakte. Aber ohne Marketing bringt einem selbst das beste und tollste Spiel nichts, denn wenn es niemand kennt, dann wird es niemand spielen und schon gar nicht kaufen.

Doch auch wenn man sich als Indie bereits frühzeitig um PR und Marketing kümmert, ist es immer leichter gesagt als getan. Wir haben relativ zeitig damit begonnen, den Kontakt zu diversen kleineren Redakteuren herzustellen, um einerseits Feedback zu bekommen und andererseits gegebenenfalls hier und da erwähnt zu werden.

Wir pflegen einen monatlichen Blog, auf dem wir über den Stand der Entwicklung des Spiels berichten und zum Teil einen Ausblick darauf geben, wohin es noch gehen wird. Außerdem stellen wir unseren Followern via Twitter und Facebook aktuelle Informationen und Wissenswertes über uns schnellstmöglich zur Verfügung. Der Erfolg war aufgrund der mangelnden Reichweite bisher allerdings etwas mäßig.

Glücklicherweise wurde es uns aber ermöglicht, mit den Jungs und Mädels von Deck13 in Kontakt zu treten. Nach einem sehr interessanten Skype Call mit Jan Klose und Marco Süß von Deck13 und dem gegenseitigen Vorstellen der Pläne und Projekte war beiden Seiten recht schnell klar, dass man es gemeinsam weit bringen kann. So wurden wir Teil der neu ins Leben gerufenen »IndieDivision« von Deck13.

Die Zusammenarbeit besonders mit Marco im Bereich Marketing öffnet uns immer wieder Tür und Tor. Außerdem bringt sie uns nach und nach dorthin, wo wir letztendlich mit unserem Spiel hinwollen.

Fazit

Als Fazit lässt sich festhalten, dass eine Entwicklung nicht stets leicht von der Hand geht und auch das Veröffentlichen des geliebten Projekts so seine Schwierigkeiten mitbringen kann. Dabei haben wir gelernt, dass man stets im Hinterkopf halten muss, dass das reine Entwickeln und Arbeiten mit diversen Programmen nur ein Teil des Ganzen ist.

Ohne ein passendes Netzwerk mit Kontakten zu all den Zielorten, an denen das Spiel ankommen soll, und ohne die Leute, die einem auf dem Weg zu diesen Orten unter die Arme greifen, bringt auch die eifrigste Arbeit nur wenig. In diesem Sinne bleibt uns noch eins zu sagen …

Danke, einfach danke

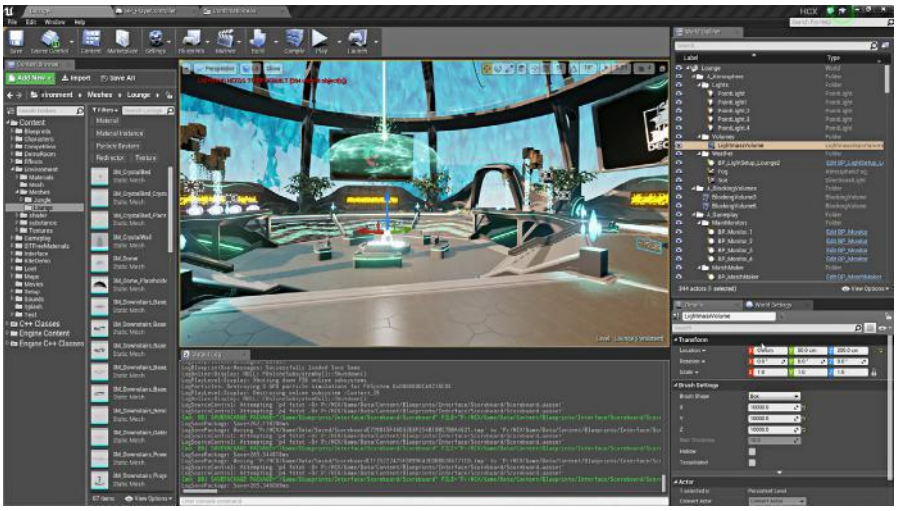
Hiermit wollen wir kurz die Gelegenheit nutzen – selbst wenn es sicher unüblich ist –, uns an dieser Stelle schlicht und einfach bei all den Leuten zu bedanken, die uns auf dem bisherigen Weg begleitet haben und noch begleiten werden.

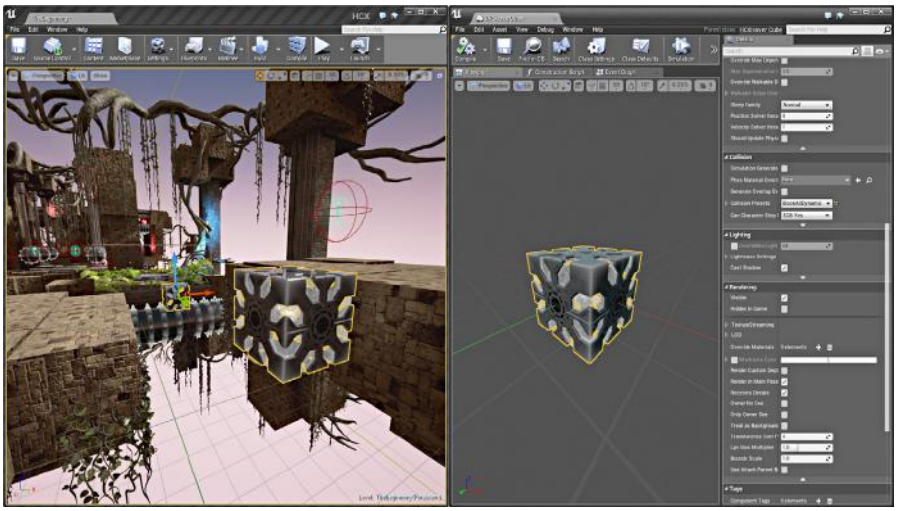
Es war eine zum Teil sehr schwere Zeit, aber Freunde und Familie haben immer zu uns gestanden. Wir können leider nicht alle namentlich erwähnen, selbst wenn wir es gern würden. Doch ein paar Personen müssen wir einfach aufzählen: Ein ganz besonders großes Danke geht natürlich an Prof. Dr. Linda Breitlauch und Prof. Dr. Christof Rezk-Salama, die uns von Anfang an tatkräftig unterstützt und das Fundament gegossen haben, auf dem wir heute noch aufbauen.

Als wertvoller Consultant und lieb gewonnener Freund stand und steht Thorsten »das Brendeltier« Rendel uns stets mit Rat und Tat zur Seite, also ebenso an dich, lieber Thorsten, ein dickes Danke! Natürlich gehören hier auch Jan Klose und Marco Süß und all die anderen Leute von Deck13 hin, die uns mit ihrer umfassenden Erfahrung und ihrem ehrlichen Feedback immer wieder in die richtige Richtung lenken.

Last but not least ein dickes Danke an Stephan Reichart – er wird genau wissen warum. Vielen Dank euch allen! **Christian Flock, Philipp Sauer**

Die Spieler sollen in einem olympisch angehauchten Wettkampf in Parcours-Manier gegeneinander antreten und in diversen Disziplinen Fallen sowie Hindernisse überwinden.





Das Belichtungssystem der Unreal Engine machte dem Team immer wieder das Leben schwer und hemmte die Entwicklung an entscheidenden Stellen. Erst der Umstieg auf die Unreal Engine 4 brachte hier Besserung.

THE IMPORTANCE OF GAME AUDIO

Sound of Games' Filipp Issa and Michael Stöckemann explain how game developers benefit from premium game music and why this service is much more than just creating a soundtrack.

Filipp Issa
is Music Producer and Business Developer at Sound of Games.

Filipp leads the creative process of all premium game music projects and runs all marketing and business activities. Filipp is the official Xing Ambassador of the German games industry. His network »Gameskoepfe« with 5000+ professionals is the largest in GSA, founded in 2008. Together with Saturn, Filipp launches Germany's biggest annual B2C center games event »Spandau Spielt«. In the 1990's, Filipp was working as a TV host and in the entertainment business, e.g. for the Love Parade and Michael Jackson.

Michael Stöckemann
is Composer at Sound of Games.

Michael writes all of Sound of Games' pieces as well as all orchestra arrangements and soloist parts. In the 2000's he has composed and produced 700+ TV and Advertisement projects for ARD, ZDF, Sat1, Mercedes Benz, Olympus and many more, and had recording artist projects with global top acts like Mungo Jerry, Dennis Morgan and Scotty Moore. Being classified as highly gifted musician, his musical education began at the age of 4 with instrument lessons and orchestra rehearsals in violin, piano, guitar, saxophone, flute and conducting. Since 2010, Michael focuses on composing premium game music only.

When game developers all over the world are looking for something very unique and high end in terms of premium game music – they most probably are contacting Sound of Games. Because we have a challenging mission: to create the best game music in the world. We call ourselves the Picassos of the game music industry – and our reach is growing year by year.

The Importance of Game Audio for Developers

Very often developers start to create a game without a clear concept of game audio. Many times, it ends up in a decision of short or limited budget, in a late stage of the production and under time pressure. Considering game audio at the very beginning of the game's concept will help the developer to ensure quality and a clear budget planning.

If we look at indie developers or small project teams, we often find that they are using licensed or stock music, or even produce the music themselves in order to finish their game. In today's competition – especially in the app market, where only the top games are displayed – the competition has drastically changed.

This puts every developer under pressure for a perfect game design and unique gaming experience for all senses. Nearly all of the top players outsource the entire game audio sector to work with the highest level of professionalism to be competitive. It can be compared to Hollywood's blockbuster productions, where film studios hire the big names in film music like Hans Zimmer, John Williams or Alexandre Desplat.

The trend of game audio is to consider it as an overall concept when designing a new game.

How Does it Work in Reality?

When a developer starts a new game and contacts their chosen game audio partner(s), it is a matter of trust, because the developer needs to open the whole idea about the game to them. This includes the first sketches, design documents and in-game scenes. Only then the briefing is useful, because every aspect of the setting and gameplay can be considered. So the developer can make sure that everything is going into the right direction.

If the developer decides to use stock music, they will find something that fits their game's setting on the internet. However, he will not be able to cover all the nuances and details of his game.

The big difference between film music and game music is that there is no linear action and many dynamic environments, so the player decides his actions and actively influences the setting and sound. This means that game audio needs to be prepared for every dynamic environment within the game.

A composer must handle many different variations of his composition adapting to the dynamic gameplay. The result is a much deeper gaming experience and simply more fun.

The Workflow

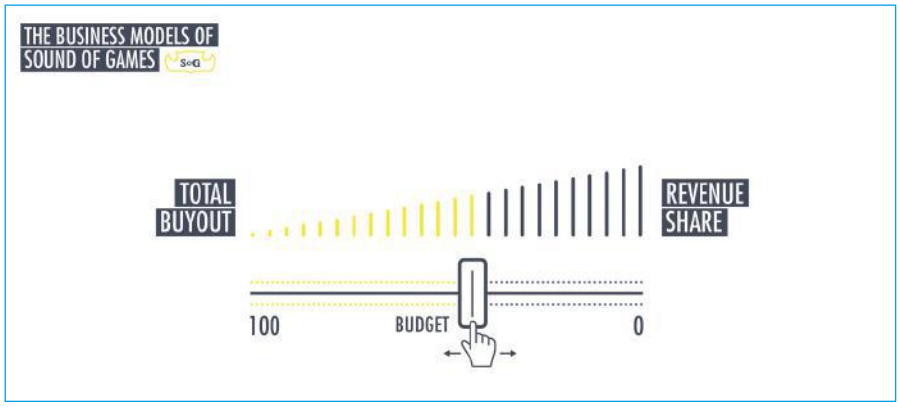
Nowadays, most of the games are made in project teams that work together in their offices or, when outsourced, over the internet. There is nothing more important than trust and the ability to fit in the project team as a team player.

At the beginning, a contract between the developer and the composer will handle all aspects about the transfer of rights of the music to the developer and which rights will still be held by the composer. Further contract details are the terms of payment, milestones and how to act with royalty collection societies. Another important part of the contract is a detailed list of all the music and sounds that need to be delivered.

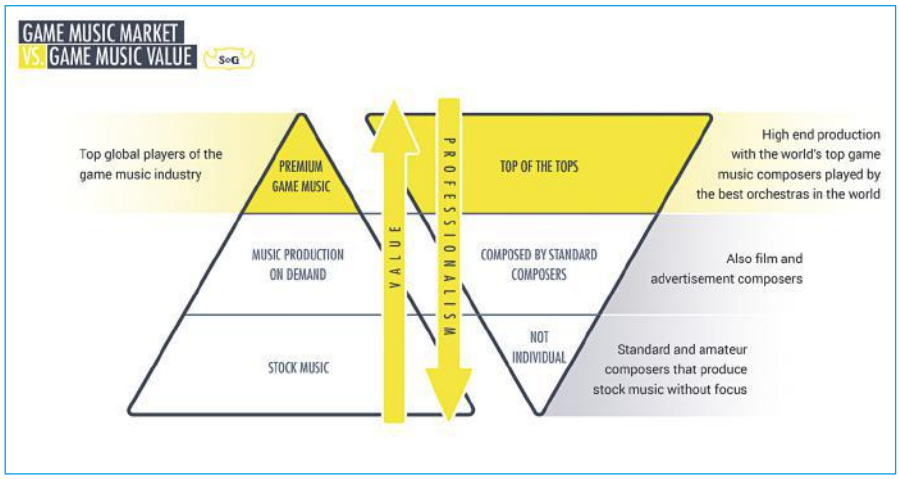
One trend regarding indie game development is the revenue share model, especially when the production budget is small or not even existing. The composer takes a part of the business risk, which means that he may not earn any money when the game is no success. The danger for the composer is that he will see no guaranteed payment unless the game generates revenue.

For most composers, this looks like a risky way to go. However, at the same time the game can only be a success for the developer if it generates revenue and all costs are covered. Therefore, for both sides (developer and composer) it is very important to evaluate the potential of the project and to make the game a financial success. Simply said: No success, no money.

Let's take a look at how we are taking up these challenges and how we manage a risk free business for all participants.



The Sound of Games business-model-fader.


GAME MUSIC MARKET
VS GAME MUSIC VALUE
Top global players of the game music industry
PREMIUM GAME MUSIC
TOP OF THE TOPS
High end production with the world's top game music composers played by the best orchestras in the world
MUSIC PRODUCTION ON DEMAND
COMPOSED BY STANDARD COMPOSERS
Also film and advertisement composers
STOCK MUSIC
NOT INDIVIDUAL
Standard and amateur composers that produce stock music without focus
VALUE
PROFESSIONALISM

The value pyramid of the game music market versus the game music value.

The Innovative Business Models of Sound of Games

The games industry has proven itself as very disruptive over the last couple of years. Everyone involved in this industry needs to act fast and flexible. We are a forerunner of creating new business models and are very flexible in working with different project teams who are spread all over the globe.

Like a fader on a mixing desk, our business models move from 100 to zero:

Large game companies usually prefer our model of a single total buyout, which makes them free to sell their game or their company and own all necessary rights of the music. Therefore, it is always a hassle-free business.

Small companies and indie developers, who have big visions and put all their passion into their projects, normally cannot afford to pay for our premium services. However, on the other hand, they need to make products that compete with the million budget games on the market. With our flexible revenue share business model, they can benefit from our premium services in full range without any trouble on spending budgets before the first income – 100 per cent risk free. We work together with developers on a success-based partnership, with our full engagement of pushing their game to the top. In this case, we act like an investor.

In the worst case, both the game developer and we don't earn anything when the game is not successful. To avoid that in the best possible way, our partners and we always start with a detailed evaluation process.

Of course, there is also a way in between those business models. The best model will be found in the evaluation process between us and the game developer, resulting in a real win-win-situation.

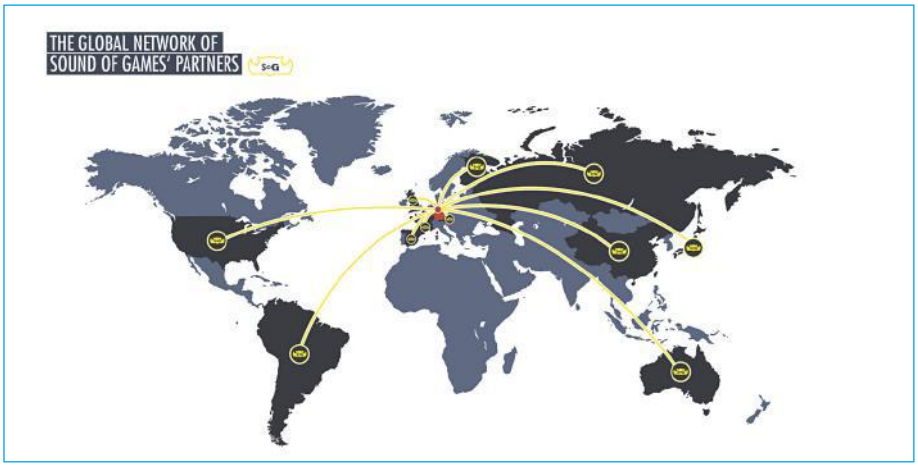
Partnerships – The Evaluation Process

It all starts with a joint vision: Develop top games and place them in the charts. It is our most important goal to create a unique masterpiece and bring it up to the top.

We get requests from all over the world, and all of them go through the evaluation process. When the developer and we agree about a masterpiece production and share the same vision, we discuss the business model options further. At the end, there is no risk for the game developer, even if he is planning to implement real and unique premium game music.

Audio Examples

To get an impression of their work, visit **makinggames.biz/sound-of-games** for audio examples.



Sound of Games' global network.

Who is Sound of Games?

With more than 50m listeners every month, Sound of Games (SoG) is the global leader of premium game music. Their demand: to make video games competitive in the very fast changing games market, and this demand is fulfilled with SoG's well known, highly flexible business models and their top notch productions which include international top orchestras and top soloists.

The Berlin- and Hamburg-based duo Sound of Games gets requested by successful game developers from all over the world. Since their founding in 2010 they are always present in the Top 100 of Apple's App Store and Google's Play Store.

Filipp and Michael are also the founders of the world's first game music publishing company with 500+ well-known game music titles, and four of their 26 label releases went into the music charts.

SoG is also famous for their successful Kickstarter campaigns which they design and develop since 2012, making every campaign a success after long and intensive planning. Until today, they have reached over 500,000 USD in Kickstarter funding with their partners. Michael and Filipp share their experience, expertise and success stories at international conferences and leading universities for creative business and studies. Their last successful Kickstarter campaign ended in January 2015 and was the highest funded piano album on KS ever (80k+ USD).

All that leads to our different approach: We build long-term, trustful partnerships with the game developers. That's why we have to evaluate the game company's motives, and if we find that there is real passion and the will for a strong partnership, all doors are open for a fruitful cooperation. It is important to know that we are not doing mass production at all and that we are fully occupied for several months, so it is a good idea to contact us on time to talk about new game concepts and projects. If the developer's idea convinces us, we are ready to evolve a real partnership on a strong basis and create a win-win situation, always with the passion to create the best possible music for the game.

Sound of Games' Unique Creative Process

Every collaboration between a developer and us is based on a deep level of trust and transparency. That is especially important at the beginning of the partnership. We are directly involved in the early stages of the game development. Our creative process is based on the first ideas, sketches, storyboards and early game design documents. Very often, we travel to places that are similar to the settings of our upcoming game production, and both of us consult lots of literature to get deeply into the setting of the game.

With this inspiration, we create a unique soundtrack concept for the game. This process can sometimes take several weeks, and it is the requirement to compose the tailor-made soundtrack for each game. All those steps are done with full involvement and the highest level of passion.

That is, by the way, how world famous movie composers like Hans Zimmer work: they start as early as possible. Sometimes they write whole orchestra suits before a single scene is shot, just by reading the screenplay.

Back in the studio, we play the very first alpha versions of the game to find out everything about where and when the music should be implemented and if multilayered music should be used. Maybe middleware like fmod or wwise are options, maybe the developer wants to build in the music on his own. Both directions will always be intensively play-tested by us.

The next steps of the production are the studio recordings. If other musicians are involved, we prepare sheet music for all of them. For an orchestra session, 1,000 pages of sheet music can easily be done for half a day of recording! We use as much live instruments in a game as possible, played by top-notch musicians that are the most experienced in their instruments.

After the recording, we edit and mix both hi-fi versions of the music and other versions optimized for each device the game will be played on. Especially for mobile devices, we do different versions in sound and compression.

Whenever live musicians are involved, we will produce making-of videos that can be used for the social media pages of the producer and publisher.

Extended cross-marketing tools during and after the game release

At the game's release, the expectations and hopes of the developers are of course very high. We do not stop working after the game is released, but offer our broad business network and popularity to push the game at launch and even afterwards.

Our soundtrack releases on our own record label can reach out to game music fans all over the world and turn them into players of the game. At the same time, this is generating a new revenue stream for the developer with no cost or risk at all. In addition, our online media network can help to get additional press coverage for the game. We speak at international top-level conferences, whenever it is about game music marketing or game music rights management. At our live gigs at events like gamescom and gamescom festival, we get in touch with thousands of game music enthusiasts and draw their attention

Michael and Filipp at work in their composers' suite.

to the games. Altogether, this is a sustainable cross-marketing tool, helping to reach out to more fans and thus helping the game to perform better.

A look into the future with Sound of Games

Because of the highly increasing numbers of mobile devices all over the world, the standards of games will rise more and more. As our vision is to create the world's finest game music, we are the first address to contact for every game developer who understands the necessity of high quality, no matter if it is about indie developers or leading global players in the games business.

Even developers that are short on budget in the beginning are well advised to build a partnership with us, because of our popularity, innovative business models and our potential of cross marketing activities can help an indie developer to get famous within a short amount of time.

Global top players, like Berlin-based game developer Wooga, cooperate with us because they are convinced that our premium game music is a state-of-the-art complement to place their games in the top charts.

For many of the top 100 games, orchestra recordings have become a new trend in the games business. From the very beginning, we have been producing high-end orchestra productions for all gaming platforms. Since then, many of them can be found in the top 100 mobile games all over the globe. We have over 20 years of experience in working with international orchestras.

That's why we expect to receive even more requests from the leading game developers, and with that we will become more and more popular over the next years as the leading brand in premium game music.

Filipp Issa, Michael Stöckemann

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DEVELOPMENT

Firma		Straße/Hausnummer	Postleitzahl/Ort		Telefon	E-Mail
3d-io		Rheingaustraße 94	65203	Wiesbaden	0611 / 5829602	info@3d-io.com
5d lab		Georges-Köhler-Allee 79	79110	Freiburg	0761 / 2038043	info@5dlab.com
Adrastea		Bielefelder Str. 5	90425	Nürnberg	0700 / 42300000	info@adrastea.com
Aesir Interactive		Grafingerstraße 6	81671	München		hq@aesir-interactive.com
ANIMA Entertainment		Konsul-Smidt-Straße 84	28217	Bremen	0421 / 5784220	info@anima-entertainment.de
AntMe!		Friedenstrasse 33	85221	Dachau		info@antme.net
B-Alive		Biberacher Straße 38	88444	Ummendorf	07351 / 441307	admin@b-alive.de
Beardshaker Games		Wartenau 16	22089	Hamburg	040 / 28471900	contact@beardshaker.com
BIGITEC		Theaterstraße 22	53111	Bonn	0228 / 42976585	info@bigitec.com
BIGPOINT	key player	Drehbahn 47-48	20354	Hamburg	040 / 8814130	info@bigpoint.net
b-interaktive		Lohbachstraße 12	58239	Schwerte	02304 / 3382391	info@binteraktive.com
Bit Barons c/o Wailua Games		Schellingstraße 35	80799	München	089 / 41617744	info@bitbarons.com
Black Forest Games		Innovationszentrum, Hauptstraße 1a	77652	Offenburg	0781 / 31057910	info@bfgames.biz
Blazing Badger		Niddastraße 64	60329	Frankfurt am Main		info@blazingbadger.com
Blue Byte	key player	Adlerstraße 74	40211	Düsseldorf	0211 / 338000	info@bluebyte.de
Blue Byte Mainz	key player	Römerpassage 1	55116	Mainz	06131 / 554470	info@related-designs.de
Bongfish		Schönaugasse 8a/2	A-8010	Graz	+43 / 676 / 7822203	info@bongfish.com
Bright Future		Gustav-Heinemann-Ufer 56	50968	Köln	0221 / 78982171	info@brightfuture.de
Brightside Games		Marie-Elisabeth-Lüders-Straße 1	10625	Berlin	0177 / 3354447	
Broken Rules Interactive Media		Johann Strauss Gasse 20/8	A-1040	Wien		hello@brokenrul.es
Bronx Studios Entertainment		Olof-Palme-Straße 13	60439	Frankfurt	069 / 870050660	info@bronxstudios.com
BSS web consulting		Savignystraße 74	45147	Essen	0201 / 5200044	info@bss-consulting.de
Buntware Games		Colmarerstrasse 9	79106	Freiburg	0761 / 3891598	contact@buntware.com
Bumblebee.		Gerresheimer Straße 7	51674	Wiehl	02261 / 4795001	tassilo@bumblebee-games.com
ByteRockers		Schivelbeiner Straße 1	10439	Berlin	030 / 232573390	info@byterockers.de
Bytro Labs		Rödingsmarkt 29	20459	Hamburg		info@bytro.com
Caipirinha Games		Kiefernweg 1a	24161	Altenholz	0431 / 324540	info@caipirinhagames.de
Candygun Games		Hamburger Strasße 132	22083	Hamburg	040 / 20947878	
cerasus.media		Rosenthaler Straße 51	10178	Berlin	030 / 802089990	info@cerasus.de
Chasing Carrots		Hornbergstraße 94	70188	Stuttgart	0711 / 64519353	office@chasing-carrots.com
Chimera Entertainment		Karlstraße 68	80335	München	089 / 210205790	info@chimera-entertainment.com
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Freudenreich & Tollknaepper		Paracelsusstraße 57	42283	Wuppertal	0202 / 2721048	mail@german-railroads.com
Funatics Software	key player	Essener Straße 66	46047	Oberhausen	0208 / 3066670	info@funatics.de
funworld		Photo Play Straße 1	A-4860	Lenzing	+43 / 7662 / 67850	info@photoplay.com
Fusionsphere Systems		Rosenau 8	86551	Aichach	0700 / 38746600	info@fusionsphere.com
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Gameforge		Albert-Nestler-Straße 8	76131	Karlsruhe	0721 / 3548080	info@gameforge.de
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it Matters Games		Am Studio 2A	12489	Berlin		info@itmattersgames.com
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dtp young entertainment		Goldbekplatz 3-5	22303	Hamburg	040 / 6699100	info@dtp-young.com
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McGame.com		Fürstenwall 69	40217	Düsseldorf	0211 / 63550100	support@mcgame.com
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ProSiebenSat.1 Games		Medienallee 6	85774	Unterföhring	089 / 950710	info@sevengames.de
Ravensburger Digital		Kaflerstraße 8	81241	München	089 / 12228180	tellme@ravensburger-digital.com
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redspotgames		Postfach 310464	80104	München	089 / 4036370	info@redspotgames.com
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RTL Games		Achnerstraße 1036	50858	Köln	0221 / 4560	entwickler@rtl-interactive.de
Rumble Media		Kriegsstraße 5	76137	Karlsruhe	0721 / 2018020	info@fettspielen.de
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SERU		Industriestraße 8	24589	Nortorf	04392 / 84900	info@seru.de
Sony Computer Entertainment		Frankfurter Straße 233	63263	Neu-Isenburg	06102 / 4330	scee_presscentre@scee.net
Square Enix		Domstraße 17	20095	Hamburg	040 / 30633400	
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Thumbr		Pfuelstraße 5	10997	Berlin	030 /300137100	info@thumbr.com
Tipp24 Entertainment		Straßenbahnring 11	20251	Hamburg		info@t24e.de
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upjers	key player	Hafenstraße 13	96052	Bamberg	0951 / 510908100	mail@upjers.com
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Film- und Medienstiftung NRW	key player	Kaistrasse 14	40221	Düsseldorf	0211 / 9305000	info@filmstiftung.de
G.A.M.E.	key player	Französische Straße 48	10117	Berlin	030 / 346550980	info@game-bundesverband.de
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Stiftung Digitale Spielkultur		Torstraße 6	10119	Berlin	030 / 29049290	kontakt@stiftung-digitale-spielekultur.de
USK	key player	Torstraße 6	10119	Berlin	030 / 24088660	kontakt@usk.de
WERK1 München		Grafinger Straße 6	81671	München	089 / 9952990	info@werk1muenchen.de

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Cologne Game Lab / Fachhochschule Köln		Ubierring 40	50678	Köln	0221 / 82753095	info@colognegamelab.de
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Gesellschaft für Personalentwicklung und Bildung		Beuthstraße 7-8	10117	Berlin	030 / 9339480	gpb-berlin@gpb-berlin.de
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EDUCATION

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SAE Institute Bochum	key player	Metzstraße 23	44793	Bochum	0234 / 93451310	bochum@sae.edu
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SAE Institute Hamburg	key player	Feldstraße 66	20359	Hamburg	040 / 23688080	hamburg@sae.edu
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Clans.de (Network)		Pinnasberg 47	20359	Hamburg	040 / 78800990	info@clans.de
CULTURETRANSLATE		Lyoner Straße 34	60528	Frankfurt am Main	069 / 659998000	info@culturetranslate.de
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Digital River		Vogelsanger Straße 78	50823	Köln	0221 / 310 88614	sales@digitalriver.com
Effective Media		Josef-Haumann-Straße 10	44866	Bochum	02327 / 22310	info@effective-media.de
Frankfurter Buchmesse		Reineckstraße 3	60313	Frankfurt am Main	069 / 21020	info@book-fair.com
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gamescom	key player	Messeplatz 1	50679	Köln	0221 / 8213894	info@koelnmesse.de
Games Foundation		Neuer Kamp 30	20357	Hamburg		info@gamesfoundation.com
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Gamify Now!		Karlstraße 68	80335	München	089 / 210205715	info@gamify-now.de
GAMINSIDE		Kaiserstraße 2-4	1070	Wien	+43 / 0676 / 5379776	info@gaminside.com
GAN Game Ad Net		Stresemannstraße 342	22761	Hamburg	040 / 67586750	info@gan-online.com
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HoneyTracks (Game Analytics)		Schelling Straße 35	80799	München	089 / 28723995	info@honeytracks.com
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INPROMO		Gasstraße 6a	22761	Hamburg	040 / 23881771	kontakt@inpromo.de
iVentureCapital		Wendenstraße 21 B	20099	Hamburg	040 / 8081250	info@iventurecapital.com
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MOTION AREA		Sommerstraße 3	65197	Wiesbaden	0611 / 56597577	info@motionarea.de
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Pixelworkshop / IG Computergrafik		Hirschengasse 1/26	1060	Wien	+43 / 1 / 5880118698	info@pixelworkshop.at
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remote control productions (Producing)		Sendlinger-Tor-Platz 6	80336	München	089 / 210205700	info@r-control.de
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Sputnic Consulting		Ehrenbergerstr. 11	98693	Ilmenau	03677 7996990	media@sputnic-consulting.com
swordfish PR (PR, Marketing)		Habsburgerplatz 2	80801	München	089 / 96160840	info@swordfish-pr.de
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Turtle Entertainment (eSport)		Siegburger Straße 189	50679	Köln	0221 / 8804490	info@turtle-entertainment.de
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Augmented Minds		Fasangartenstraße 134	81549	München	089 / 69386904	info@augmented-minds.com
BiteTheBytes (Middleware)		St. Gallener Straße 9	36039	Fulda	0661 / 2006899	info@bitethebytes.com
B.TON Medien (Audio, Musik)		Luise-Ullrich-Straße 4	82031	Grünwald	089 / 189425490	mix@bton.de
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Chromatrix (Mobile Gaming)		Kalkofenstraße 2	72411	Bodelshausen	07471 / 740828	info@chromatrix.com
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Creature Factory		Graefestraße 33	10967	Berlin	030 / 26301330	info@creature-factory.com
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DICO Deutschland	key player	Freiburger Straße 5	51107	Köln	0221 / 20430504	info@dico4u.com
Doublesmith (Art/Animation)		Ranzonigasse 3/3	A-3100	St. Pölten	+43 / 699 / 19447880	mail@doublesmith.com
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eurosimtec		Merowingerplatz 1	40225	Düsseldorf	0211 / 3018560	info@eurosimtec.de
Exit Games (Network Engine)		Hongkongstraße 7	20457	Hamburg	040 / 4135960	business@exitgames.com
Eye Rock Media (Design, Animation)		Essenerstraße 3	46047	Oberhausen	0208 / 82858923	contact@eyerock.de
fadeout (Audio Design)		Austraße 6	CH-4153	Reinach	+41 / 7 / 92793244	info@fadeout.ch
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Games Quality (Quality Assurance)		Zum Wasserwerk 15	15537	Erkner	03362 / 885688	info@games-quality.com
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Goal Games		Feurigstraße 54	10827	Berlin	030 / 78957102	info@goal-games.de
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Havok		Arbachtalstraße 6	72800	Eningen	0712 / 1986993	info@havok.com
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metricminds (Grafik)		Rüsselsheimer Straße 22	60326	Frankfurt am Main	069 / 7593380	info@metricminds.com
MobileBits (Mobile Engine)		Lerchenstraße 28	22767	Hamburg	040 / 33429566	info@mobilebits.de
morro images (Grafik)		August-Bebel-Straße 27	14482	Potsdam-Babelsberg	0331 / 97996610	info@morroimages.com
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Ein Tag bei ...
REMOTE CONTROL PRODUCTIONS

Die Postinvader haben auch remote control productions erwischt und zeigen eindeutig, wo im neuen Bürogebäude die Spielefirma ansässig ist.

Projekt-Managment by the Dark Force: Darth Vader at work.

Die Wolpertinger in ihrem natürlichen Lebensraum, mit allerlei Spielzeug zur Inspiration und Zerstreuung.

Malen nach Zahlen: 50 Millionen Downloads können die hier gezeichneten Angry Birds aus »Angry Birds Epic« bereits verbuchen.

Ein kurzer Blick in den QA-Dschungel von Chimera Entertainment, dem Entwickler hinter Titeln wie »Angry Birds Epic« und »Bernd das Brot und die Unmöglichen«.

The Gaming Central: Unter einem Dach sind remote control productions, Chimera Entertainment, GAMESin FLAMES, GAMIFY *now!* und wolpertinger beheimatet.

Seit dem Erfolg von »Angry Birds Epic« übernehmen die namensgebenden Vögel langsam das Büro ...

Wer hier mal muss, der sollte den Unterschied zwischen He-Man und Wonder Woman kennen.

Eine Karriere bei Lucas Arts blieb Art Director Knut leider verwehrt.

Unter dem Dach von remote control productions feilen mehr als ein Dutzend Spielefirmen an Titeln wie »Angry Birds Epic«. Die neue Münchner Zentrale beheimatet rcp und vier weitere Firmen aus der Family.

Die tägliche Morgenroutine, ohne die kein Spieleentwickler auskommt, wird auch bei remote control productions hoch gehalten: Kaffee und Schnack.

Eine gute Meeting-Vorbereitung ist alles!

Getreu dem Motto »Producers gonna produce« sitzt die Production-Abteilung in einem Cluster zusammen.

Wer hart arbeitet, hat sich in der Pause »Brot und Spiele« verdient.

Von exotischen Filmen, hippen Serien bis zu Marshall McLuhan gibt's allerhand in der firmeneigenen Bibliothek.

Der Geschäftsführer von remote control productions Hendrik Lesser versteht es das Motto »Make better games or die trying« mit schlagkräftigen Argumenten durchzusetzen.

»Wie Nerd-Figuren? Das sind große Kunstgegenstände!«

Qual der Wahl: bayerische Nymphen oder holländische Gerichte?

Ein kurzer »Mexican standoff« zum Feierabend.

MAKING GAMES VORSCHAU

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Making of Anno 2205

Vor wenigen Wochen erst kündigte Blue Byte den neusten Ableger der Anno-Reihe auf der E3 an und schon plaudern die Mainzer aus dem Nähkästchen, wie das nun im Weltraum angesiedelte Aufbauspiel entsteht und wie sie die ambitionierten Ziele, wie das umfangreiche Endlosspiel, eine lange Kampagne und die bisher größten Städte umsetzen wollen. Grund für uns, nach World of Warships direkt noch ein Making of anzukündigen, auch wenn es eher unkonventionell ist.

Weitere Themen

Endless Legend

Das Team von Amplitude Studios gibt Einblicke, wie sie ein einfaches UI entworfen haben, das für ein komplexes Runden-Strategiespiel funktioniert.

Engine-Case-Study

Sproings Head of Console Technology erklärt, in welchen Fällen es sinnvoll ist, eine Engine zu lizensieren und wann man eine eigene entwickeln sollte.

Spieleentwicklung für VR

Samsung und die Black River Studios blicken auf die Entwicklung ihres Titels Rococo zurück und teilen ihre Erkenntnisse zum Thema Virtual Reality.

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